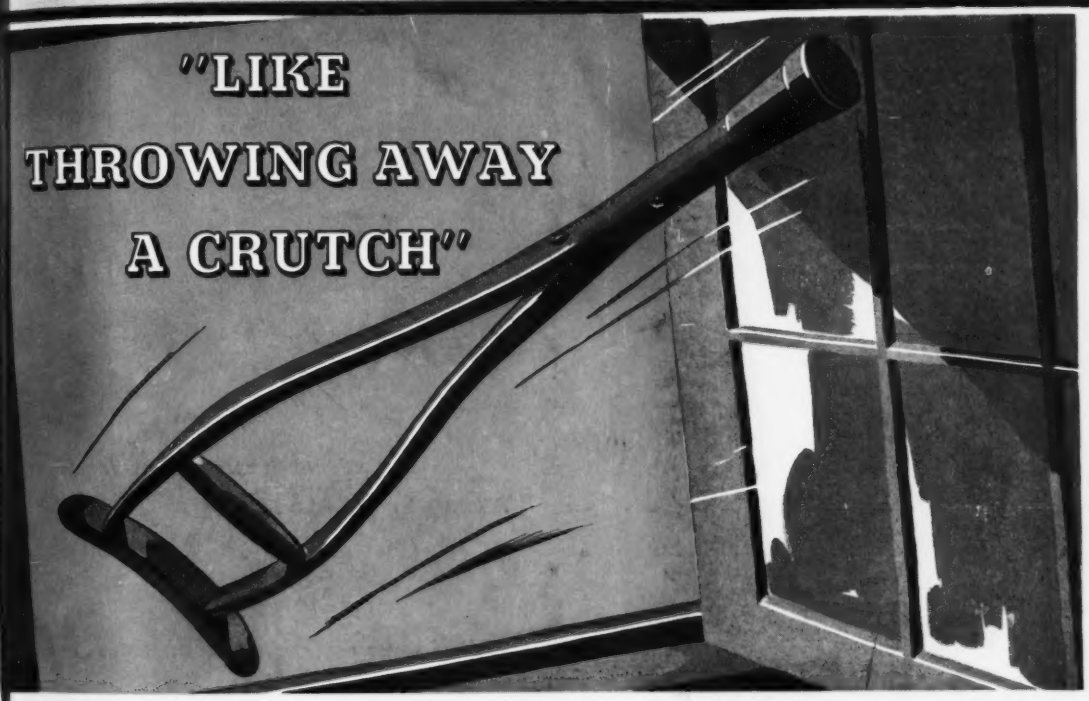
PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD



Bearings were "limping along" on the crutch of poor lubrication. Lubrication costs... wear... and maintenance were excessive. The superintendent called in a Tide Water engineer. Investigation resulted in this simple recommendation: "What you need is less soap and more real lubricant per pound of grease. Use Tycol Green Cast Grease."

They followed the recommendation. The "crutch" went out the window. Costs went down — down more than 25%! And the reason is equally simple: Tycol Green Cast Greases come from highest grade paraffine base cylinder stock oils, giving "body" with a very *minimum* of soap... the greatest lubrication per pound of grease.

Tycol Green Cast Greases are made in consistencies to suit every need. Why not have a Tide Water engineer survey *your* operations... make recommendations? Remember that no one lubricant is universal in scope. You'll get the Tycol lubricant that's "engineered to fit the job."

TIDE WATER ASSOCIATED OIL COMPANY
TIDE WATER DIVISION
17 Battery Place, New York, N. Y.

INDUSTRIAL TYCOL OILS-GREASES

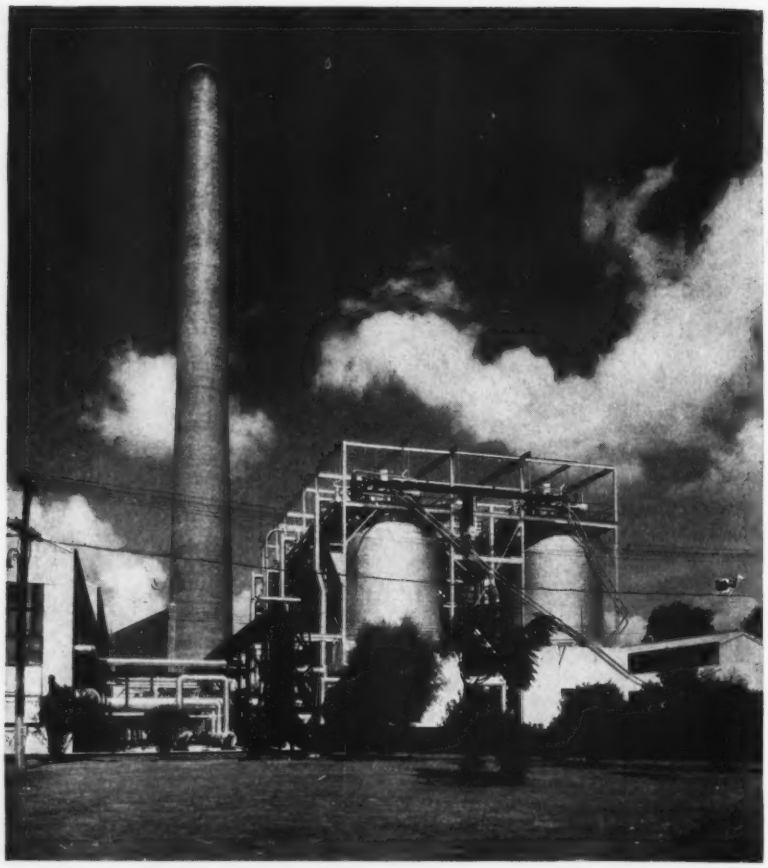
TIDE WATER INDUSTRIAL LUBRICANTS

THERE IS A COMPLETE LINE OF TYCOL LUBRICANTS SCIENTIFICALLY ENGINEERED FOR EVERY INDUSTRIAL USE

NOV. 24 1938

Vol. CVII
No. 21

LIBRARY
UNIVERSITY OF WASHINGTON
SEATTLE



Sulphur Service

Sulphur and Water Don't Mix

Hence American Industry has available a raw material—Sulphur—of unsurpassed purity.

Each day, millions of gallons of superheated water are forced into enormous deposits of Sulphur of the Texas Gulf Sulphur Company. The Sulphur melts, sinks, is then forced to the surface and on cooling is ready for use.

Each day, millions of gallons of water, enough for a city of good size, are treated and softened in order to maintain continuous production at the sulphur mines.

Every step in the production of Texas Gulf Sulphur is conducted with care and with the most efficient equipment in order to provide Chemical Industry with a constant, uniform supply of this element of many uses.

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Newgulf and Long Point, Texas

Entered as second class matter at the Post Office at East Stroudsburg, Pa., under the Act of Congress of March 3, 1879. Published every Thursday by the Lockwood Trade Journal Co., at 34 N. Crystal St., East Stroudsburg, Pa. Executive and Editorial office: 15 W. 47th St., New York, N. Y. Domestic subscription U. S. and possessions, $4.00 per year.

PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

Published Every Thursday by the LOCKWOOD TRADE JOURNAL CO., Inc.

Executive and Editorial Offices: 15 West 47th Street, N. Y. C.
Western Rep.—H. K. Vinton, 123 W. Madison St., Chicago, Ill.

The Contents of this Publication are Copyrighted

TABLE OF CONTENTS

Paper Duties Lowered in Canadian Treaty .. 11
S. D. Wells Joins Paper Institute 16
Joint Printing Committee Opens Paper Bids .. 17
Chicago Trade Better Than Expectations 27
News of the Wisconsin Paper Industry 28
Government Insists on Proration Agreement .. 29
Make Wrapping From Grass Pulp 29
Financial News of Pulp and Paper Industry .. 30
A. P. W. Approves Interest Cut 22
Scott Paper Co. Nets $1,107,532 22
American Writing Shows Loss 22
Northern Paper Company Incorporates 31
Obituary 31
Bulletin Describes Wide Use of AMSCO 31
Boston Paper Trade Association Meets 32
Chillicothe's Outstanding Citizen 32
Pacific TAPPI Discussed Foreign Laboratories 33
N. E. TAPPI Discusses New Processes 33
Delaware TAPPI Discusses Paper Conditioning 34
Empire State TAPPI Discussed Machinery .. 34
Smith Kaplan Turbines 34
Editorial 36
Production Ratio Report 37
J. A. Church Lectures on Papermaking 37

Technical Section

Review of the Paper Industry Literature .. 39
A Survey of the American Literature in the Field of Cellulose and Related Subjects for 1933 Through 1937 40
Color Council Paper Published 48
To Hold Fuel Conference Dec. 14 48
Crane Research Laboratories 48
Michigan Superintendents Meet 49
Government Paper Bids 49
Imports of Paper and Paper Stock 51
New York Market Review 53
Miscellaneous Markets 54
Market Quotations 56

The PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Copyright, 1938, by the Lockwood Trade Journal Co., Inc.

TOWMOTORS CLEVELAND

CUT HANDLING COSTS *as High as* 50%

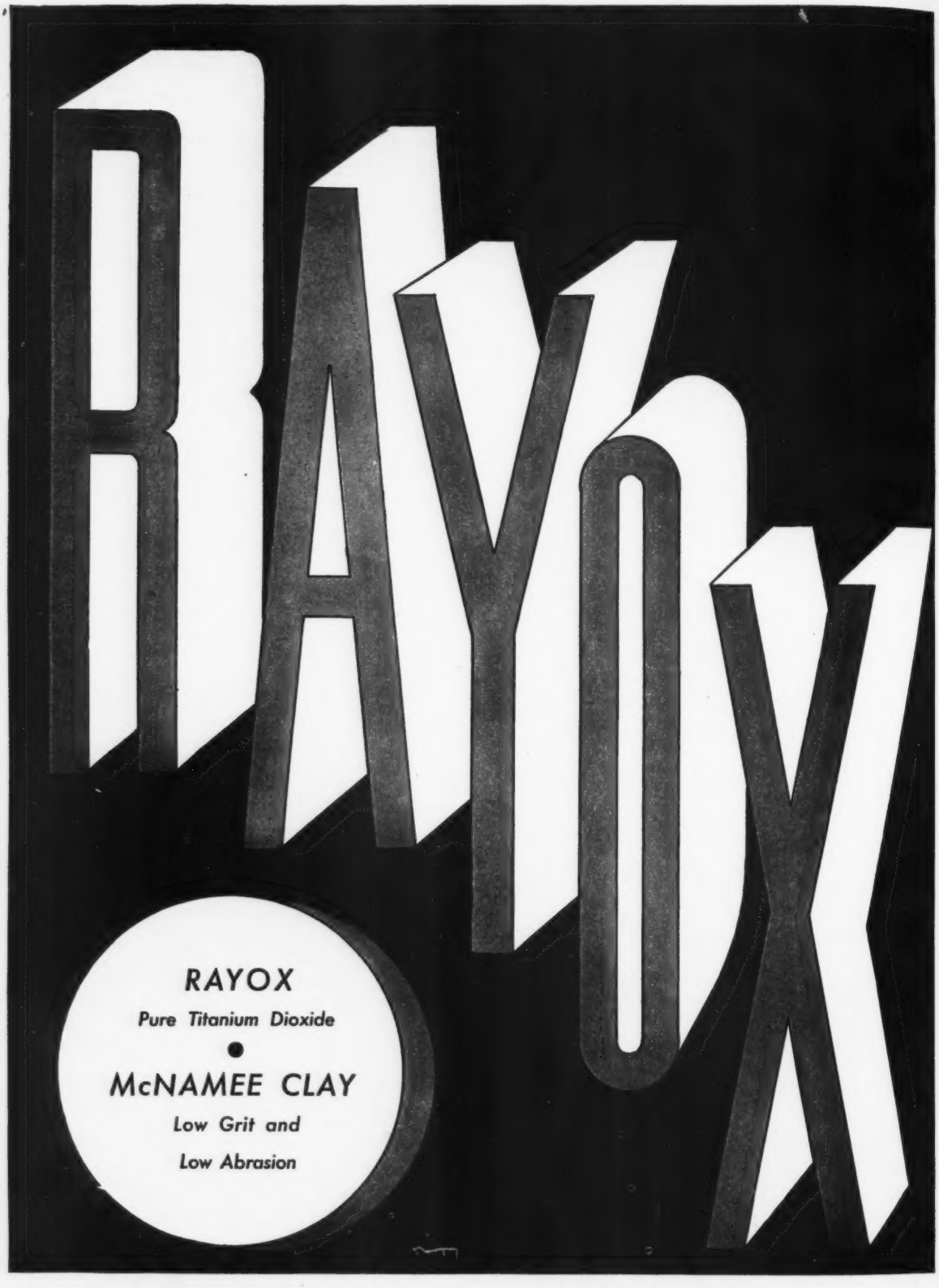
Reasonable profits at present prices and on present production methods is more easily assured, with maximum improvement and economy in handling equipment. Scores of experienced pulp, paper and container men have already agreed that TOWMOTOR is the answer. We invite you to join them as TOWMOTOR users. Write for details today.

Straight Gas Powered Since 1919

TOWMOTOR CO.

1220 EAST 152ND ST. CLEVELAND, OHIO

New York Office: 92 Liberty St., Phone: Rector 2-3977



R. T. VANDERBILT CO., INC • 230 PARK AVENUE, NEW YORK

PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

PAPER

SIXTY-SEVENTH YEAR

Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with Paper Trade Journal.

Vol. CVII, No. 21 Thursday, November 24, 1938

Established Sept. 21, 1918
Consolidated Feb. 19, 1925
with Paper Trade Journal.

Paper Duties Lowered in Canadian Treaty

New Reciprocal Trade Agreement Signed Last Week At Washington, D. C., Provides For Duty Reduction of One-Third On Uncoated Book and Printing Papers and 50 Per Cent On the Lower Grade of Tissues.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 23, 1938—Under the trade agreement entered into last week by the United States and Canada under the paper schedule, a reduction of about one-third was made in the duty on uncoated book and printing paper. The duties on cheaper grades of tissue and crepe paper, are reduced by 50 per cent. The rate on hanging paper is made 7½ in place of 10 per cent. Of course standard newsprint paper and pulp are left on the free list.

Huge Items in Imports From Canada

Paper-making materials and newsprint paper, long free of duty, are huge items in the imports from Canada. The 1936 agreement with Canada bound the continued free entry of pulpwood, newsprint paper, and the three classes of wood pulp of which that country is the principal foreign supplier. A previous agreement with Sweden had similarly bound the free entry of the other three classes of wood pulp, Sweden being the principal foreign supplier of these. In the new Canadian agreement all kinds of wood pulp, as well as pulpwood and newsprint paper, are bound free. The total value of the imports of these items from Canada in 1937 was $155,000,000.

The United States has long been dependent on imports for a large part of its paper requirements. For the last 10 years or more, imports of paper materials and paper have accounted for about half of our total paper consumption. Any sudden and marked reduction in imports through the imposition of duties would greatly derange our paper-manufacturing and paper-using industries. Imports have consisted chiefly of white paper and materials for making it. The stands in this country of spruce and balsam fir, hitherto considered almost the only species suitable for making white paper, have been greatly depleted. Recent developments indicate the possibility of large production of white paper from southern pine, the supplies of which are relatively abundant. There has already been an immense expansion in the production of brown paper and paperboard in the South.

Newsprint Most Largely Imported

Total imports of newsprint paper, which is free of duty, are many times greater in value than the combined imports of all other forms of paper, all of which are dutiable. Domestic production of several of these dutiable classes of paper is very large, while the imports are small and often consist of special types not sharply competitive with any domestic product.

Canada is the principal supplier of only a few kinds of dutiable paper. The 1936 agreement made maximum duty reductions on pulpboard in rolls for wallboard, both unprocessed and processed, and these are continued in the new agreement. The most important new concession is on uncoated book and printing paper, on which the rate has been lowered from ¼ cent per pound plus 10 per cent ad valorem to 1/5 cent per pound pluc 5 per cent. Although the imports of this class of paper in the last 2 years have been much larger than before, they were still less than 1½ per cent of the domestic production. The duty on hanging paper, not printed (the basic material for wall paper), is reduced from 10 to 7½ per cent ad valorem.

Tissue paper is dutiable under the act of 1930 at 5 cents per pound plus 15 per cent ad valorem and 6 cents per pound plus 20 per cent ad valorem, according to the weight of the paper. The specific part of these compound duties is prohibitive of imports of tissue paper of the ordinary grades. Therefore the imports are confined to high-grade material of various types, coming chiefly from European countries and from Japan. By the agreement with Canada the two duties above mentioned are reduced by 50 per cent but only with respect to tissue paper valued at not over 15 cents per pound (foreign value basis). Hitherto there have been practically no imports valued below that amount. The bulk of the domestic production of tissue paper is of grades valued in this country at less than 6 cents per pound. A maximum reduction has also been made in the duty on crepe paper valued at no more than 12½ cents per pound.

Details of the United States concessions on paper from Canada are shown in Table I:

Details of the American concessions are shown in the following:

Schedule 14—Paper and Books

Uncoated book and printing paper, not specially provided for (par. 1401).

The duty on this paper is reduced from ¼ cent per pound plus 10 per cent ad valorem to 1/5 cent per pound plus 5 per cent. Canada supplied over 80 per cent of the 15,000 tons, valued at $715,000, imported in 1937. Even with a marked increase in imports in recent years, they have been less than 1 per cent of the domestic production of over 1,000,000 tons per year. Imports from Canada are chiefly of low-grade printing paper.

Pulpwood in rolls for wallboard, not processed, and not specially provided for (par. 1402).

The reduction from 10 to 5 per cent ad valorem in the 1936 agreement is continued. Canada is practically the sole supplier of imports, which in 1937 amounted to over 11,000 tons, valued at $489,000. Domestic production is very large. Tissue paper and all similar paper, not specially provided for, valued not over 15 cents per pound (par. 1404).

Tissue paper has been dutiable at 5 cents per pound plus 15 per cent ad valorem, and 6 cents per pound plus 20 per cent ad valorem, according to the weight of the paper. Because the specific part of these compound duties is prohibitive of imports of tissue paper of the grades specified, imports have been confined to high-priced material coming chiefly from countries other than Canada. Under the new agreement with Canada these compound duties are reduced by 50 per cent on tissue paper valued at not over 15 cents per pound. Canada is equipped to produce low-priced tissue, and any imports are likely to originate in that country. Domestic production of toilet and toweling tissue usually selling at about 5 cents per pound is very large.

Crepe paper, valued at not more than 12½ cents per pound (par. 1404).

The duty on crepe paper valued not over 12½ cents per pound is reduced from 6 cents per pound plus 15 per cent ad valorem to 3 cents per pound plus 7½ per cent ad valorem. Imports are insignificant compared with the large domestic production; Canada, however, is a potential supplier of this grade of crepe paper. Hanging paper, not printed, etc. (par. 1409).

The duty on imported hanging paper (unprinted wall paper) is reduced from 10 to 7½ per cent ad valorem. Imports are less than 3 per cent of domestic production. Canada was practically the sole foreign source in 1936 and 1937, in the latter year supplying about 6,000,000 pounds, valued at about $139,000.

Tourist literature (par. 1410).

Tourist literature is segregated from other printed matter by a reclassification. On such literature of bona fide foreign authorship the duty is reduced from 15 to 7½ per cent ad valorem, and on all other such literature from 25 to 12½ per cent ad valorem. The duty on printed matter consisting chiefly of drawings, photographs, maps, etc., is reduced from 25 to 12½ per cent ad valorem. There are no statistics of imports or of domestic production, but the latter is very large. Canada is believed to be the largest foreign source.

Pulpboard in rolls for manufacture of wallboard, processed (par. 1413).

Canada is the sole supplier of processed pulpboard for use in the manufacture of wallboard, but imports in 1937 were valued at only $3,000. The maximum reduction to 15 per cent ad valorem granted in the 1936 agreement with Canada is continued.

The former 35 per cent rate on paper board and allied products from the United States into Canada was reduced to 25 per cent by the 1936 most-favored-nation provision. Imports increased from $432,000 in 1935 to $811,000 in 1937. The rate has been further reduced to 22½ per cent in the new schedule I. On wallpapers the former compound rate, equivalent to about 50 per cent ad valorem, was reduced to 32½ per cent by the 1936 agreement (schedule I), and imports increased over 60 per cent; the rate is now reduced to 30 per cent. On wrapping paper the duty which had been 35 per cent in 1935 and 30 per cent under the most-favored-nation provision of the 1936 agreement is made 25 per cent (imports in 1937, $274,000).

Schedule I of the 1936 agreement reduced the duty on paper not otherwise provided for from 25 to 22½ per cent, and the same rate is named in the new agreement, carrying with it removal of the 3 per cent excise tax. This item formerly included electric cable insulating paper and condenser paper but these two types have now been segregated at a rate of 10 per cent. Imports of the item as a whole increased from $767,000 in 1935 to $1,431,000 in 1937.

On ruled papers, paper in boxes, paper pads, etc. (imports in 1937, $705,000), the duty is fixed at 27½ per cent; it had been 35 per cent plus tax in

TABLE I.—LIST OF INDIVIDUAL CONCESSIONS MADE BY THE UNITED STATES

Paragraph, Tariff Act of 1930	Description of commodity	Rate of duty: Before first agreement (1935)	Rate of duty: Before new agreement	Rate of duty: Under new agreement	Ad valorem equivalent of new rate	Value of imports, 1937 (preliminary): Total	Value of imports, 1937 (preliminary): From Canada
	Schedule 14.—Papers and Books						
1401	Uncoated book and printing paper, not specially provided for	¼c per lb. + 10%	¼c per lb. + 10%	⅛c per lb. + 5%	14	715,428	513,624
1402	Pulpboard in rolls for wallboard, not processed, and not specially provided for	10%	5%	5%	5	488,893	488,893
1404	Tissue paper and all similar paper, not specially provided for, valued not over 15 cents per pound:						
	Weighing not over 6 pounds to the ream	6c per lb. + 20%	6c per lb. + 20%	3c per lb. + 10%	..	.....	.....
	Weighing over 6 pounds and less than 10 pounds to the ream	5c per lb. + 15%	5c per lb. + 15%	2½c per lb. + 7½%	..	.....	.....
1404	Crepe paper, valued at not more than 12½ cents per pound	6c per lb. + 15%	6c per lb. + 15%	3c per lb. + 7½%	..	.....	.....
1409	Hanging paper, not printed, etc.	10%	10%	7½%	7½	$139,474	$138,832
1410	Tourist literature containing historical, geographic, time table, travel, hotel, and similar information:						
	If of bona fide foreign authorship	15%	15%	7½%	7½	——	——
	All other	25%	25%	12½%	12½	——	——
1410	Tourist literature consisting principally of drawings, engravings, etchings, etc.	25%	25%	12½%	12½	(1)	(1)
1413	Pulpboard in rolls for wallboard, processed	$14.50 per short ton, min. 15% max. 30%	15%	15%	15	3,118	3,118

Sample Card
14-FQ
Shows 30 New
Colors for
Southern Kraft
Write for a Copy
Today

SEE FOR YOURSELF WHAT COLOR CAN DO FOR SOUTHERN KRAFT

Better than we could tell you, our new Sample Card 14-FQ shows what color can do for Southern Kraft—if it's a Dybryte X Color!

Dybryte X Colors have been developed specifically by our Technical Service Staff and Laboratory men to suit the individuality of Southern Kraft, and to meet the problems of large-scale production of this useful stock. Shades are good, clean and bright, and their fastness to bleeding is a decided improvement over previous colors for calender staining.

Dybryte X Colors are good to work with, giving uniform, level shades both at the calender end of the paper machine itself or on the usual types of staining machines.

Sample Card 14-FQ shows 30 samples of run-of-the-mill Southern Kraft calender stained with our new colors for this stock. For comparison it shows several samples of Unbleached Sulphite calender stained with the same colors.

Write today for your free copy of Sample Card 14-FQ. It will show you how much more attractive, usable and *salable* you can make Southern Kraft with Dybryte X Colors.

H & M
DYES
ARE
BETTER
BUYS

Heller & Merz

90 WEST STREET, NEW YORK, N. Y. • BOSTON CHICAGO • SPRINGFIELD, Mass. • PHILADELPHIA

DIVISION OF THE CALCO CHEMICAL COMPANY, INC.

A DIVISION OF AMERICAN CYANAMID COMPANY

TABLE II.—LIST OF INDIVIDUAL CONCESSIONS MADE BY CANADA

Canadian tariff item	Description	Unit of duty	Rates of duty: December, 1935	Rates of duty: November, 1938	Rates of duty: New rate
192	Prepared roofing, wall boards, paper boards, and fiber boards	Ad val.	35%	25%	22½%
192b	Sandpaper, glass or flint paper, and emery paper or emery cloth	Ad val.	25%	22½%	20%
192d	Electrical insulating pressboard, not less than .040 inch in thickness	Ad val.	35%	25%	12½%
*195	Paper hanging or wall papers, including borders or bordering	Ad val. and lb.	35% and 2c	32½%	30%
*197	Paper of all kinds, n. o. p.	Ad val.	25%	22½%	22½%
*Ex 197	Electric cable insulating paper and condenser paper	Ad val.	25%	22½%	10%
197b	Wrapping paper of all kinds, not pasted, coated, or embossed	Ad val.	35%	30%	25%
198	Coated, ruled, and boxed papers, pads, etc.	Ad val.	35%	32½%	27½%
*199	Papeteries, envelopes, and all manufacturers of paper, n. o. p.	Ad val.	35%	30%	27½%
199b	Paperboard containers	Lb. or ad val.	1½c	1¼c	1c
199c	Waxed stencil paper for use on duplicating machines	Ad val.	35%	32½%	27½%
200	Pulp of wood, of straw, or of any other vegetable fiber	Ad val.	25%	22½%	Free

1935. The same 27½ per cent rate is applied to the "basket" item of paper manufactures, which includes papeteries, envelopes, paper napkins, and many other items; the duty had been 35 per cent in 1935 and was reduced to 30 per cent by schedule I of the 1936 agreement. Imports increased from $897,000 in 1935 to $1,155,000 in 1937. Paperboard containers were formely dutiable at 1½ cents per pound, with an ad valorem minimum of 35 per cent. By virtue of the most-favored-nation provision of the 1936 agreement (after amendatory Canadian legislation) the rate became 1¼ cents per pound, with a minimum of 30 per cent; imports in 1937 were nearly double those of 1935. The rate has now been reduced by schedule I to 1 cent per pound, with a minimum of 30 per cent.

Although the United States imports great quantities of wood pulp from Canada, there is also some trade in the opposite direction (713,000 in 1937). This was formerly dutiable at 25 per cent. The most-favored-nation provision brought the rate down to 22½ per cent in 1936. In the new agreement wood pulp is transferred to the Canadian free list, to correspond with the free entry into the United States.

Other paper commodities on which duties are reduced by schedule I include works of fiction; books and magazines in languages other than English (made free); sandpaper, emery paper, emery cloth; electrical insulating pressboard; and waxed stencil paper.

The table II shows Canadian concessions:

Concessions in United Kingdom Agreement

In the trade agreement with the United Kingdom several concessions were made by that country to the United States on paper and related products.

The United States is only a minor supplier of British imports of most of the articles in this field. For example, the 20 per cent duty on paper towels, napkins, and handkerchiefs is reduced to 16-2/3 per cent, and similar cuts made in the duties on vulcanized fiber and paper dress patterns.

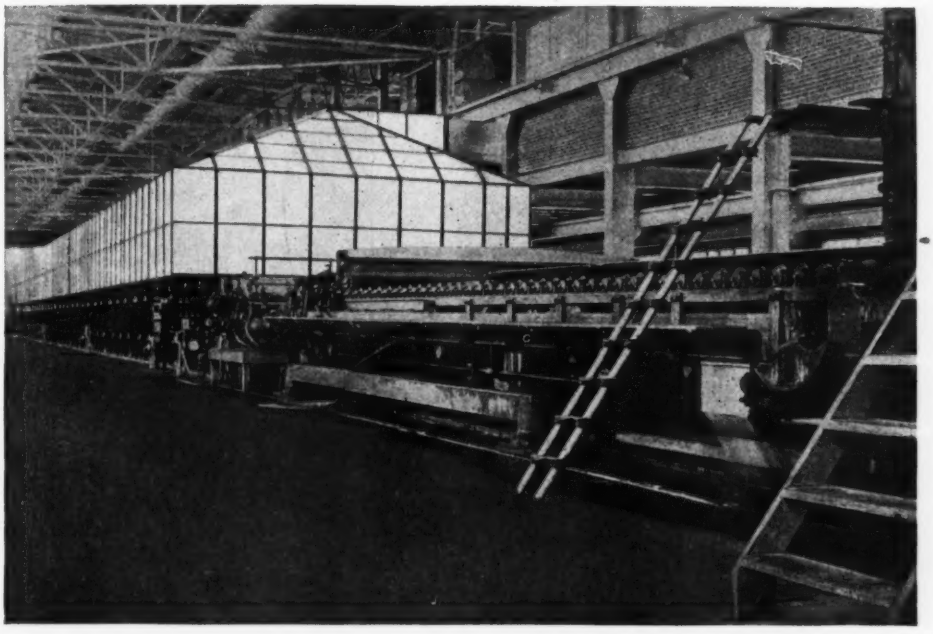
The general group of products classified in the United Kingdom as stationery, including paper and pulp products and stationery items other than paper, is of considerable and growing importance to the United States, and a number of duty reductions have been obtained in respect thereof which should result in a substantial benefit to American trade.

The value of the total imports of the pulp and paper group into the United Kingdom from the United States rose from over $2,500,000 in 1935 to over $3,100,000 in 1937, and a further increase is registered in the first 6 months of 1938. However, the United States is only a comparatively minor supplier to the United Kingdom of this group as a whole, supplying only 3.6 per cent of the total im-

TABLE III.—CONCESSIONS ON IMPORTS INTO THE UNITED STATES

Par., act of 1930	Description of commodity	Rate of duty: Before agreement	Rate of duty: Under agreement	Reduction of duty	Ad valorem equivalent of rate under agreement
1402	Sheathing and roofing paper, and deadening sheathing and roofing felt	10%	10%	Bound	10
1404	Stereotype paper, valued over 15c lb.:				
	Weighing not over 6 lbs. per ream	6c lb. + 20%	4c lb. + 15%	27	24
	Weighing over 6 lbs., and less than 10 lbs. per ream	5c lb. + 15%	4c lb. + 10%	28	18
1404	Pottery paper, valued over 15c lb.:				
	Weighing not over 6 lbs. per ream	6c lb. + 20%	4c lb. + 15%	29	25
	Weighing over 6 lbs., and less than 10 lbs. per ream	5c lb. + 15%	4c lb. + 10%	26	20
1404	Carbon paper, coated or uncoated, valued over 15c lb.:				
	Weighing not over 6 lbs. per ream	6c lb. + 20%	4c lb. + 15%	28	23
	Weighing over 6 lbs., and less than 10 lbs. per ream	5c lb. + 15%	4c lb. + 10%	27	19
1404	India and Bible paper:				
	Weighing 10 lbs. or more and less than 20½ lbs. per ream	4c lb. + 15%	2c lb. + 10%	39	14
1405	Simplex decalcomania paper, not printed	5c lb. + 10%	2½c lb. + 10%	37	24
1405	Unsensitized plain basic paper, to be sensitized for use in photography	5%	5%	Bound	5
1405	Boxes of paper, papier-mache, or wood covered or lined with surface-coated parchment, lithographed or similar papers, not covered or lined with fabric	5c lb. + 20%	5c lb. + 10%	34	19
1406	Postcards, lithographically printed, exceeding 20/1000-inch in thickness, valued over 35c lb.	8¾c lb.	6c lb.	31	11
1406	All other lithographic prints, etc., n. s. p. f., exceeding 20/1000-inch in thicknes, valued over 35c lb.	8¾c lb.	6c lb.	31	20
1407(a)	Handmade paper, and paper commonly or commercially known as handmade or machine-handmade paper, weighing 8 lbs. or over per ream, valued at 50c or more per lb.	3c lb. + 15%	2c lb. + 10%	n. a.	n. a.
1407(a)	Drawing paper, whether made by hand or machine, weighing 8 lbs., or more per ream, valued at 40c or more per lb.	3c lb. + 15%	2c lb. + 10%	33	16
1408	Plain cut envelopes, filled or unfilled, made of various kinds of paper	Rate on paper plus 5%	Rate on paper plus 2½%	10	26
1408	Envelopes, filled, or unfilled, tinted, bordered, embossed, printed, lined, or decorated in the manufacture of (except lithogrpahic), made of various kinds of paper	Rate on paper plus 10%	Rate on paper plus 5%	15	29
1408	Envelopes, filled or unfilled:				
	Lithographed in the manufacture—made of various kinds of paper	Rate on paper plus 30%	Rate on paper plus 15%	n. a.	n. a.
1409	Blotting paper	30%	15%	50	15
1409	Hanging paper, printed, lithographed, dyed, or colored	1½c lb. + 20%	1c lb. + 10%	47	13
1409	Filtering paper, valued at 75c or more per lb.	5c lb. + 15%	2½c lb. + 7½%	50	8

ANOTHER BELOIT MACHINE



THIS FINE PAPER MACHINE IS THE PRODUCT OF THE MODERN ENGINEERING AND MANUFACTURING FACILITIES WHICH MAKE BELOIT THE LEADER IN MEETING THE EXACTING DEMANDS OF THE PAPER INDUSTRY

THE BELOIT WAY BELOIT IRON WORKS PAPER MACH'Y BELOIT, WIS., U.S.A. **IS THE MODERN WAY**

ports in 1937, Sweden, Finland, Norway, Germany, and the Netherlands being the principal suppliers, so that it has been necessary to restrict the concessions to specified items of chief interest to the United States. The most important of these are vulcanized fiber and paper dress patterns, and the former duty of 20 per cent ad valorem on these items is reduced to 16-2/3 and 15 per cent, respectively. The 20 per cent duty on paper towels, paper napkins (serviettes), and paper handkerchiefs is also being reduced to 16-2/3 per cent, this being the rate granted by the United Kingdom on a number of other paper products included in earlier trade agreements with other countries.

Imports into the United States from all countries of paper and books dutiable under schedule 14, were valued at $24,089,000 in 1929, at $8,497,000 in 1933, and at $15,113,000 in 1937. Imports under this schedule from the United Kingdom of products on which duties are reduced or bound were valued at $2,840,000 in 1937. Reductions are made on 24 classifications, imports under which were valued at $2,655,000; and the duties on 2 classifications, imports under which were valued at $185,000, are bound at existing rates. Some of the important classifications affected by the agreement are:

The duty is reduced on carbon paper weighing not over 6 pounds per ream from 6 cents per pound and 20 per cent ad valorem, to 4 cents per pound and 15 per cent ad valorem, and on carbon paper weighing over 6 and less than 10 pounds per ream from 5 cents per pound and 15 per cent ad valorem, to 4 cents per pound and 10 per cent ad valorem. Total imports were valued at $542,000 in 1937, of which the United Kingdom supplied $393,000. Imports consist almost entirely of uncoated paper of fine grade and high unit value. Domestic production of uncoated carbon paper is concentrated on the relatively low-priced grades.

Concessions made by the United States to the United Kingdom on paper articles are shown in Table III:

S. D. Wells Joins Paper Institute

In continuation of its policy of adding well-known men to its staff, Westbrook Steele, executive director of the Institute of Paper Chemistry takes pleasure in announcing that Sidney D. Wells becomes a member of its research staff and faculty on December 1, 1938, with the rank of research associate and as an instructor in pulp and paper technology. Mr. Wells is widely known among his associates in the pulp and paper field, since he has been identified with the industry for thirty years as a research engineer, in an operating capacity and as a consultant.

Graduating from Massachusetts Institute of Technology in 1907, he served as assistant chemist for the Central Aguirre Company of Puerto Rico in 1908 and as chemical engineer for the Mead Pulp and Paper Company in 1909-1910. He then accepted appointment as engineer in forest products at the Forest Products Laboratory, Madison, Wis., where he remained until 1925, with the exception of the year 1916-1917, when he was assistant superintendent and chemist for the Chesapeake Pulp and Paper Company.

During his association with the Forest Products Laboratory he was interested in many phases of pulp and paper making, among which the following may be mentioned. With John D. Rue, he prepared Bulletin 1485 of the United States Department of Agriculture, which contains a summary of the pulping and grinding characteristics of a large variety of American woods; besides this, he published a number of papers on the pulping of southern woods. He assisted in studies on the value of flax straw and cotton linters as papermaking materials and was interested in the development of the semichemical pulping process. He spent some time on the question of deinking waste paper and proposed the use of bentonite for this purpose. Another development with which he was intimately connected was the application of the rod mill to pulping and bleaching

SIDNEY D. WELLS

operations. During this time, also he began his work on boards, studying, among other raw materials, the suitability of oat hulls and straw.

In 1925 he left the Forest Products Laboratory to become director of the Paper Mill Laboratories, Inc., at Quincy, Ill., where he remained until 1930. While engaged in general consulting work during this period, he was especially interested in the manufacture of board from straw and was able to develop an odorless egg-case filler board.

He was technical director of Nekoosa-Edwards Paper Company from 1930 to 1932 and technical adviser for Combined Locks Paper Company from 1932 to 1935. His chief interest with Nekoosa-Edwards was the development of a multi-stage bleaching for kraft pulp. At Combined Locks he perfected a method of deinking groundwood papers, particularly old telephone directories. For the last three years he has been a member of the consulting firm of Paulson & Wells.

Mr. Wells is a member of the American Institute of Chemical Engineers, the American Chemical Society, the Society of American Foresters, the Technical Association of the Pulp and Paper Industry, the American Pulp and Paper Mills Superintendents Association, and the American Association for the Advancement of Science.

He is also a member of Alpha Chi Sigma and of Sigma Xi.

Joint Printing Committee Opens Paper Bids

Thirty-Six Concerns Make Offers For Supplying Government Printing Office With Paper For Six Months Period Beginning Jan. 1—Prices Submitted Lower In Some Cases Than In May — Awards On November 28.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 23, 1938—Thirty-six bids were received by the Joint Congressional Committee on Printing on Monday for the semi-annual supply of paper for the use of the Government Printing Office for the six months' period beginning January 1 next. At the last paper bid opening in May thirty-two bidders were represented. Several new names appear in the list of bidders. Government officials, after hastily surveying the bids stated that the prices in some cases were lower than in May. There were fewer identical bids. The Joint Committee will meet next Monday, November 28, for the purpose of making awards.

The bids were as follows:

Newsprint

No. 1—1,000,000 lbs., 24x36—64; rolls, 24, 36, and 48 ins. wide (3-inch fiber cores, with metal ends).

Old Dominion Paper Co.	2.99277c
National Pulp & Paper Co., Inc.	2.425c
Paper Corp. of U. S.	2.995c

Machine-Finish Book

No. 3—400,000 lbs., 25x38—70; flat, cut 24x32, 28x38, and 31¼x45½ ins.

Graham Paper Co.	5.65c
Mudge Paper Co.	5.26c
Bradner Smith & Co.	5.65c
Perkins-Goodwin Co.	5.18c
John F. Post, Inc.	5.65c
Stanford Paper Co.	5.33c
Barton, Duer & Koch Paper Co.	5.54c
R. P. Andrews Paper Co.	5.65c
Frank Parsons Paper Co.	5.08c
Whitaker Paper Co.	4.98c
Marquette Paper Co.	5.54c

No. 4—400,000 lbs., 25x38—70; flat, cut 24x38 and 38x48 ins.

Graham Paper Co.	5.65c
Mudge Paper Co.	5.26c
Bradner Smith & Co.	5.65c
Perkins-Goodwin Co.	5.18c
John F. Post, Inc.	5.65c
Stanford Paper Co.	5.33c
Barton, Duer & Koch Paper Co.	5.44c
R. P. Andrews Paper Co.	5.65c
Frank Parsons Paper Co.	5.08c
Whitaker Paper Co.	4.98c
Marquette Paper Co.	5.54c

No. 5—500,000 lbs., 25x38—70; flat, cut 24x38 and 38x48 ins.

Graham Paper Co.	5.65c
Mudge Paper Co.	5.26c
Bradner Smith & Co.	5.65c
Perkins-Goodwin Co.	5.18c
John F. Post, Inc.	5.65c
Stanford Paper Co.	5.33c
Barton, Duer & Koch Paper Co.	5.44c
R. P. Andrews Paper Co.	5.65c
Frank Parsons Paper Co.	5.07c
Whitaker Paper Co.	4.97c
Marquette Paper Co.	5.54c

No. 6—350,000 lbs., 25x38—70; rolls, 18, 21, and 28½ ins. wide (3-inch fiber cores).

Graham Paper Co.	5.23c
Mudge Paper Co.	4.82c
Bradner Smith & Co.	5.23c
Perkins-Goodwin Co.	4.80c
John F. Post, Inc.	5.27c
Stanford Paper Co.	4.95c
Fitchburg Paper Co.	4.85c
Barton, Duer & Koch Paper Co.	5.01c
R. P. Andrews Paper Co.	5.28c
Frank Parsons Paper Co.	4.455c
Whitaker Paper Co.	4.48c
Marquette Paper Co.	5.14c
Paper Corp. of U. S.	5.088c

No. 7—400,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide. (3-inch fiber cores).

Graham Paper Co.	5.23c
Mudge Paper Co.	4.82c
Bradner Smith & Co.	5.23c
Perkins-Goodwin Co.	4.80c
John F. Post, Inc.	5.27c
Stanford Paper Co.	4.95c
Fitchburg Paper Co.	4.85c
Barton, Duer & Koch Paper Co.	5.02c
R. P. Andrews Paper Co.	5.28c
Frank Parsons Paper Co.	4.45c
Whitaker Paper Co.	4.47c
Marquette Paper Co.	5.14c
Paper Corp. of U. S.	5.088c

No. 8—400,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide (3-inch fiber cores).

Graham Paper Co.	5.23c
Mudge Paper Co.	4.82c
Bradner Smith & Co.	5.23c
Perkins-Goodwin Co.	4.80c
John F. Post, Inc.	5.27c
Stanford Paper Co.	4.95c
Fitchburg Paper Co.	4.85c
Barton, Duer & Koch Paper Co.	5.01c
R. P. Andrews Paper Co.	5.28c
Frank Parsons Paper Co.	4.45c
Whitaker Paper Co.	4.47c
Marquette Paper Co.	5.14c
Paper Corp. of U. S.	5.088c

No. 9—300,000 lbs., 25x38—70; rolls, 24, 36, and 48 ins. wide (3-inch fiber cores).

Graham Paper Co.	5.23c
Mudge Paper Co.	4.28c
Bradner Smith & Co.	5.23c
Perkins-Goodwin Co.	4.80c
John F. Post, Inc.	5.27c
Stanford Paper Co.	4.95c
Fitchburg Paper Co.	4.85c
Barton, Duer & Koch Paper Co.	5.01c
R. P. Andrews Paper Co.	5.28c
Frank Parsons Paper Co.	4.46c
Whitaker Paper Co.	4.48c
Marquette Paper Co.	5.14c
Paper Corp. of U. S.	5.088c

No. 10—200,000 lbs., 25x38—80; rolls, 32 ins. wide (3-inch fiber cores).

Graham Paper Co.	5.29c
Mudge Paper Co.	4.76c
Bradner Smith & Co.	5.29c
Perkins-Goodwin Co.	4.83c
John F. Post, Inc.	5.29c
Stanford Paper Co.	4.98c
Fitchburg Paper Co.	4.88c
Barton, Duer & Koch Paper Co.	5.15c
R. P. Andrews Paper Co.	5.29c
Frank Parsons Paper Co.	4.51c
Whitaker Paper Co.	4.44c
Cauthorne Paper Co.	4.87c
Marquette Paper Co.	5.20c
Paper Corp. of U. S.	5.088c

No. 11—250,000 lbs., 25x38—80; flat, cut 24x38, 33¾x64, and 38x48 ins.

Graham Paper Co.	5.39c
Mudge Paper Co.	4.98c
Bradner Smith & Co.	5.29c
Perkins-Goodwin Co.	4.93c
John F. Post, Inc.	5.39c
Stanford Paper Co.	5.09c
Barton, Duer & Koch Paper Co.	5.23c
R. P. Andrews Paper Co.	5.39c
Frank Parsons Paper Co.	4.86c
Whitaker Paper Co.	4.87c
Cauthorne Paper Co.	4.97c
Marquette Paper Co.	5.29c
Paper Corp. of U. S.	5.39c

No. 12—400,000 lbs., 25x38—100; flat, cut 22¼x32¼, 24x38, 24¼x 36¼, 32x42, 38x48 and 41x52 ins.

Mudge Paper Co.	4.73c
Perkins-Goodwin Co.	4.70c
John F. Post, Inc.	5.14c
Stanford Paper Co.	4.85c
Butler Co.	5.23c
Barton, Duer & Koch Paper Co.	4.97c
R. P. Andrews Paper Co.	5.14c
Frank Parsons Paper Co.	4.61c
Whitaker Paper Co.	4.77c
Cauthorne Paper Co.	4.81c
Paper Corp. of U. S.	5.14c

No. 13—10,000 lbs., 25x38—120 and 140; flat, cut 29x41, 32x52, and 38x48 ins. Min. order 5,000 lbs.

Mudge Paper Co.	4.76c
Perkins-Goodwin Co.	4.70c
Stanford Paper Co.	4.85c
Barton, Duer & Koch Paper Co.	5.25c
R. P. Andrews Paper Co.	5.14c
Paper Corp. of U. S.	5.14c

No. 14—15,000 lbs., blue and salmon, 25x38—70 and 100; flat, cut 25x38 and 38x48 ins. Min. order, one color, 5,000 lbs.

Stanford Paper Co. (70 lbs.)	8.00c
(100 lbs.)	9.20c

Machine-Finish Book End Paper

No. 15—36,000 lbs., for waste leaves; flat, cut 25x38—160; the grain to run the 38-inch way.

Graham Paper Co.	6.125c
Perkins-Goodwin Co.	4.94c
Stanford Paper Co.	5.38c
Butler Co.	6.00c
Barton, Duer & Koch Paper Co.	5.32c
R. P. Andrews Paper Co.	5.38c
Paper Corp. of U. S.	5.38c

Offset Book

No. 16—300,000 lbs., 25x38—120; flat, cut 24x38, 26x32, 28x40, and 38x48 ins.; grain as ordered.

Graham Paper Co.	5.85c
Perkins-Goodwin Co.	5.33c
John F. Post, Inc.	5.62c
Stanford Paper Co.	5.85c
Butler Co.	5.75c
Barton, Duer & Koch Paper Co.	5.219c
R. P. Andrews Paper Co.	5.67c
Whitaker Paper Co.	4.98c
Aetna Paper Co.	5.77c
Marquette Paper Co.	5.25c
Paper Corp. of U. S.	5.588c

Antique Book

No. 17—300,000 lbs., 25x38—100 and 120; flat, cut 33x43, and 38x50 ins.

Old Dominion Paper Co.	4.93c
Graham Paper Co.	5.75c
Perkins-Goodwin Co.	4.94c
John F. Post, Inc.	5.38c
Stanford Paper Co.	5.10c
Barton, Duer & Koch Paper Co.	5.36c
R. P. Andrews Paper Co.	5.38c
Whitaker Paper Co.	4.68c
Cauthorne Paper Co.	4.91c
Aetna Paper Co.	5.38c
Paper Corp. of U. S.	5.288c

Lightweight Machine-Finish Book

No. 18—40,000 lbs., 25x38—60; flat, cut 32x48 and 38x48 ins.

Old Dominion Paper Co.	5.64c
Stanford Paper Co.	5.82c
Barton, Duer & Koch Paper Co.	6.16c

50 Per Cent Rag Lightweight Machine-Finish Book

No. 19—50,000 lbs., 25x38—60; flat, cut 32x48 and 38x48 ins.

Paper Corp. of U. S.	11.78c

50 Per Cent Rag Antique Book

No. 20—100,000 lbs., 25x38—80; flat, cut 32x48 and 38x48 ins.

R. P. Andrews Paper Co.	9.97c
Whitaker Paper Co.	8.94c
Aetna Paper Co.	7.778c
Paper Corp. of U. S.	8.39c

No. 21—50,000 lbs., 25x38—80; flat, cut 22¾x31½, 29x41 and 31½x45½ ins.

R. P. Andrews Paper Co.	9.97c
Whitaker Paper Co.	8.84c
Aetna Paper Co.	7.778c
Paper Corp. of U. S.	8.39c

No. 22—100,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 42 ins.

R. P. Andrews Paper Co.	9.97c
Whitaker Paper Co.	8.74c
Aetna Paper Co.	7.628c
Paper Corp. of U. S.	8.24c

75 Per Cent Rag Laid Antique Book

No. 23—20,000 lbs., 25x38—140; flat, cut 24x38 and 29x41 ins.; the laid marks to run the 24-inch and 29-inch direction of the sheet; the grain and chain marks to run lengthwise of the sheet.

Walker-Goulard-Plehn Co.	13.37c
Schapiro Paper Co.	13.37c
Barton, Duer & Koch Paper Co.	12.87c
R. P. Andrews Paper Co.	9.97c
Whitaker Paper Co.	11.03c
Aetna Paper Co.	9.748c
Paper Corp. of U. S.	10.62c

100 Per Cent Rag Antique Book

No. 24—5,000 lbs., 25x38—90; flat, cut 24x38 and 38x48 ins.; the grain to run lengthwise of the sheet. Min. order 5,000 lbs.

Barton, Duer & Koch Paper Co.	16.34c
R. P. Andrews Paper Co.	16.33c
Whitaker Paper Co.	18.25c
Lee Paper Co.	15.37c

No. 25—10,000 lbs., 25x38—140; flat, cut 24x38 and 38x48 ins.; the grain to run lengthwise of the sheet. Min. order 10,000 lbs.

Schapiro Paper Co.	17.60c
Barton, Duer & Koch Paper Co.	15.86c
R. P. Andrews Paper Co.	16.33c
Whitaker Paper Co.	18.25c
Lee Paper Co.	15.11c

Supercalendered Book

No. 27—800,000 lbs., 25x38—90 and 100; flat cut 31¼x45½, 32x48, 34x44, and 38x48 ins.

Mudge Paper Co.	5.44c
Perkins-Goodwin Co.	5.20c [1] 4.94c [2]
John F. Post, Inc.	5.64c [1] 5.38c [2]
Stanford Paper Co.	5.35c [1] 5.10c [2]
Barton, Duer & Koch Paper Co.	5.65c [1] 5.38c [2]
R. P. Andrews Paper Co.	5.65c [1] 5.38c [2]
Frank Parsons Paper Co.	4.82c
Whitaker Paper Co.	5.17c
Cauthorne Paper Co.	5.36c

[1] 90 lbs. [2] 100 lbs

No. 28—100,000 lbs., 25x38—120 and 140; flat, cut 35x45, 38x48, and 38x51 ins.

Mudge Paper Co.	5.01c
Perkins-Goodwin Co.	4.94c
John F. Post, Inc.	5.38c
Stanford Paper Co.	5.10c
Barton, Duer & Koch Paper Co.	5.38c
R. P. Andrews Paper Co.	5.38c
Frank Parsons Paper Co.	4.89c
Whitaker Paper Co.	5.05c
Cauthorne Paper Co.	5.31c

No. 29—100,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide (3-inch fiber cores).

Mudge Paper Co.	4.93c
Perkins-Goodwin Co.	4.84c
John F. Post, Inc.	5.29c
Stanford Paper Co.	4.98c
Barton, Duer & Koch Paper Co.	5.29c
R. P. Andrews Paper Co.	5.29c
Frank Parsons Paper Co.	4.52c
Whitaker Paper Co.	4.64c
Paper Corp. of U. S.	5.088c

No. 30—500,000 lbs., 25x38—100; rolls, 38 ins. wide (3-inch fiber cores).

Mudge Paper Co.	4.645c
Perkins-Goodwin Co.	4.60c
Stanford Paper Co.	4.75c
Barton, Duer & Koch Paper Co.	5.14c
R. P. Andrews Paper Co.	5.04c
Frank Parsons Paper Co.	4.26c
Whitaker Paper Co.	4.48c
Paper Corp. of U. S.	4.888c

No. 31—500,000 lbs., 25x38—100; rolls, 38 ins. wide (3-inch fiber cores).

Mudge Paper Co.	4.645c
Perkins-Goodwin Co.	4.60c
John F. Post, Inc.	5.04c
Stanford Paper Co.	4.75c
Barton, Duer & Koch Paper Co.	5.14c
R. P. Andrews Paper Co.	5.04c
Frank Parsons Paper Co.	4.26c
Whitaker Paper Co.	4.62c
Paper Corp. of U. S.	4.888c

Coated Book

No. 36—500,000 lbs., 25x38—140 and 160; flat, cut 24x32, 24x38, 29x41, 38x48 and 38x50 ins.; the grain to run lengthwise of the sheet.

Graham Paper Co.	6.95c
John F. Post, Inc.	6.30c
Stanford Paper Co.	6.14c
Butler Co.	6.437c
Barton, Duer & Koch Paper Co.	6.88c
R. P. Andrews Paper Co.	6.30c
Whitaker Paper Co.	6.47c
Enterprise Paper Co.	6.82c
Virginia Paper Co.	6.96c

50 Per Cent Rag Coated Book

No. 37—20,000 lbs., 25x38—140 and 160; flat, 38x48 ins.; the grain to run lengthwise of the sheet.

Virginia Paper Co.	11.91c

50 Per Cent Rag Machine-Finish Lithograph

No. 40—30,000 lbs., 25x38—160; flat, cut 26x38 ins., the grain to run lengthwise of the sheet.

Graham Paper Co.	10.78c
Schapiro Paper Co.	10.78c
R. P. Andrews Paper Co.	9.97c
Whitaker Paper Co.	10.43c
Aetna Paper Co.	8.498c

Mimeograph, White and Colored

No. 43—800,000 lbs., white, Nos. 40 and 48; flat, cut 24½x30½, 24½x32, 24½x38, 26x42½, and 28½x34½ ins.; the grain to run lengthwise of the sheet.

Graham Paper Co.	5.75c
Stanford Paper Co.	5.09c
Barton, Duer & Koch Paper Co.	4.81c
R. P. Andrews Paper Co.	5.385c
Whitaker Paper Co.	4.67c
Cauthorne Paper Co.	4.59c
Aetna Paper Co.	5.24c
Marquette Paper Co.	5.18c
Paper Corp. of U. S.	5.388c

No. 44—80,000 lbs., blue, buff, green, pink and yellow, No. 40; flat, cut 24½x30½, 24½x32, 24½x38 and 26x42½ ins.; the grain to run lengthwise of the sheet. Min. order, one color, 10,000 lbs.

Old Dominion Paper Co.	5.979c
Graham Paper Co.	6.25c
Stanford Paper Co.	5.59c
Barton, Duer & Koch Paper Co.	6.14c
R. P. Andrews Paper Co.	6.13c
Whitaker Paper Co.	6.02c
Aetna Paper Co.	5.74c

25 Per Cent Rag Mimeograph

No. 47—2,500,000 lbs., Nos. 40 and 48; flat, cut 24½x30½, 24½x32, 24½x38, 26x42½, and 28½x34½ ins.; the grain to run lengthwise of the sheet.

Old Dominion Paper Co.	5.7784c
Walker-Goulard-Plehn Co.	6.0276c
Stanford Paper Co.	6.25c 6.65c
Barton, Duer & Koch Paper Co.	6.17c
Whitaker Paper Co.	7.18c
Cauthorne Paper Co.	6.11c
Aetna Paper Co.	5.438c
Paper Corp. of U. S.	6.127c

Blue U S M O Safety Writing

No. 51—350,000 lbs., No. 32; rolls, 22 ins. wide, 24 ins. in diameter (3-inch fiber cores).

Geo. Lamonte & Son.	10.48c
R. P. Andrews Paper Co.	10.08c

U S M O Writing, White and Blue

No. 52—10,000 lbs., No. 32; rolls, 8½ inches wide, 24 ins. in diameter (3-inch fiber cores). Min. order, either color, 4,000 lbs.

R. P. Andrews Paper Co.	9.05c 9.65c

Safety Writing, Colored

No. 53—5,000 lbs., blue, gray, green, pink salmon, and yellow, No. 40; flat, cut 17x28, 21x32, and 22x34 ins. Min. order, one color, 2,000 lbs.

Stanford Paper Co.	10.93c
R. P. Andrews Paper Co.	11.65c
Whitaker Paper Co.	11.95c
Mathers-Lamm Paper Co.	12.59c

Sulphite Writing, White and Colored

No. 55—2,500,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max width 34 ins.

Old Dominion Paper Co.	5.3454c
Graham Paper Co.	6.19c
Perkins-Goodwin Co.	4.75c
Stanford Paper Co.	5.50c
Barton, Duer & Koch Paper Co.	5.09c
R. P. Andrews Paper Co.	6.00c
Whitaker Paper Co.	5.28c
Cauthorne Paper Co.	6.06c
Aetna Paper Co.	5.23c
Marquette Paper Co.	5.24c
Paper Corp. of U. S.	5.61c

No. 56—2,500,000 lbs., white, Nos. 40 and 48; flat, cut any size, min. width 21 ins., max. width 34 ins.

Old Dominion Paper Co.	5.2464c
Graham Paper Co.	6.00c
Perkins-Goodwin Co.	4.60c
Stanford Paper Co.	5.21c
Barton, Duer & Koch Paper Co.	4.97c
R. P. Andrews Paper Co.	5.82c
Whitaker Paper Co.	4.95c
Cauthorne Paper Co.	6.06c
Aetna Paper Co.	5.13c
Marquette Paper Co.	5.12c
Paper Corp. of U. S.	5.44c

No. 57—40,000 lbs., white, No. 26; rolls, min. width 16 ins., max. width 38 ins. (3-inch fiber cores).

Graham Paper Co.	5.85c
Butler Co.	5.75c
Barton, Duer & Koch Paper Co.	5.84c
R. P. Andrews Paper Co.	5.67c
Cauthorne Paper Co.	6.74c
Aetna Paper Co.	6.02c
Paper Corp. of U. S.	5.56c

No. 58—600,000 lbs., white, No. 32; rolls, min. width 16 ins., max. width 38 ins. (3-inch fiber cores).

Old Dominion Paper Co.	4.8508c
Graham Paper Co.	5.55c
Perkins-Goodwin Co.	4.25c
Barton, Duer & Koch Paper Co.	4.79c
R. P. Andrews Paper Co.	5.38c
Whitaker Paper Co.	4.50c
Cauthorne Paper Co.	5.72c
Aetna Paper Co.	4.98c
Paper Corp. of U. S.	5.16c

• When problems arise pertaining to the use of Liquid Chlorine you need expert counsel—and you usually need it quickly. EBG's staff is trained to solve such problems with promptness and efficiency. Whatever your needs for liquid chlorine, whatever your problems regarding its use, you can count on getting quick action from EBG—with a full measure of the old-time courtesy.

ELECTRO BLEACHING GAS COMPANY

MAIN OFFICE: 60 EAST 42nd STREET, NEW YORK, N. Y. • PLANT: NIAGARA FALLS, N. Y.

EBG Liquid Chlorine
FIRST IN THE COUNTRY

No. 59—40,000 lbs., white, Nos. 40 and 48; rolls, min. width 16 ins., max width 38 ins. (3-inch fiber cores).

Graham Paper Co.	5.40c
Perkins-Goodwin Co.	4.25c
Butler Co.	5.20c
Barton, Duer & Koch Paper Co.	4.85c
R. P. Andrews Paper Co.	5.24c
Cauthorne Paper Co.	5.48c
Aetna Paper Co.	4.98c
Paper Corp. of U. S.	5.16c

No. 60—20,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 26; flat, cut any size, min. width 21 ins., Max. width 34 ins. Min. order, one color, 5,000 lbs.

Barton, Duer & Koch Paper Co.	6.90c
Cauthorne Paper Co.	7.76c
Aetna Paper Co.	7.12c

No. 61—2,000,000 lbs., blue, buff, cherry, green, pink salmon and yellow Nos. 32 and 40; flat, cut any size, min. width 21 ins., max. width 34 ins. Min. order, one color, 10,000 lbs.

Graham Paper Co.	6.35c
Mudge Paper Co.	5.73c
Perkins-Goodwin Co.	5.75c
Stanford Paper Co.	5.95c
Barton, Duer & Koch Paper Co.	5.70c
R. P. Andrews Paper Co.	6.15c
Cauthorne Paper Co.	5.814c
Aetna Paper Co.	5.64c
Marquette Paper Co.	5.59c
Paper Corp. of U. S.	6.31c

100 Per Cent Rag White Writing

No. 63—2,500 lbs., No. 56; flat, cut 21x32 ins. Min. order 2,500 lbs.

Stanford Pape rCo.	18.23c
Barton, Duer & Koch Paper Co.	19.40c
R. P. Andrews Paper Co.	22.10c
Lee Paper Co.	23.91c

Lithograph-Finish Map

No. 64—10,000 lbs., Nos. 32 and 40; flat, cut 24x38, 30x40, 32x48, 36x52, and 38x48 ins. Min. order, one substance, 5,000 lbs.

Graham Paper Co.	6.95c
Butler Co.	6.95c
R. P. Andrews Paper Co.	6.75c
Whitaker Paper Co.	6.94c

50 Per Cent Rag Lithograph-Finish Map

No. 65—50,000 lbs., Nos. 40, 48 and 56; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Graham Paper Co.	9.78c
Baxter Paper Co.	9.78c
Walker Goulard Plehn Co.	11.88c
Stanford Paper Co.	10.32c
Butler Co.	10.42c
Barton, Duer & Koch Paper Co.	10.70c
R. P. Andrews Paper Co.	12.73c
Whitaker Paper Co.	12.96c
Mathers-Lamm Paper Co.	10.22c
Aetna Paper Co.	10.488c

75 Per Cent Rag Lithograph-Finish Map

No. 66—100,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Mudge Paper Co.	12.11c
Butler Co.	12.11c
Barton, Duer & Koch Paper Co.	12.28c
R. P. Andrews Paper Co.	12.13c
Aetna Paper Co.	12.568c
Lee Paper Co.	14.42c

No. 67—100,000 lbs., Nos. 48 and 56; flat, cut any size, min. width 30 ins., max. width 48 ins.; the grain to run lengthwise of the sheet. Min. order, one substance, 5,000 lbs.

Mudge Paper Co.	11.91c
Walker-Goulard-Plehn Co.	14.47c
Butler Co.	11.87c
Barton, Duer & Koch Paper Co.	12.00c
R. P. Andrews Paper Co.	11.57c
Aetna Paper Co.	12.428c
Lee Paper Co.	13.92c

100 Per Cent Rag White Chart, Lithograph-Finish

No. 69—200,000 lbs., No. 96; flat, cut any size, min. width 22 ins., max width 46 ins.; packed in cases of 1,000 sheets each; the grain to run lengthwise of the sheet unless otherwise specified.

Graham Paper Co.	22.14c
Stanford Paper Co.	17.92c
Butler Co.	16.28c
Schapiro Paper Co.	22.14c
Barton, Duer & Koch Paper Co.	16.72c
R. P. Andrews Paper Co.	16.89c
Frank Parsons Paper Co.	17.26c
Lee Paper Co.	17.89c

Sulphite Manifold, White and Colored

No. 70—140,000 lbs., white, No. 18; flat, cut 21x32, 22x34, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size.

Import Paper Co.	6.70c
Old Dominion Paper Co.	6.744c
Graham Paper Co.	6.50c
Bradner Smith & Co.	7.45c
R. P. Andrews Paper Co.	7.00c
Whitaker Paper Co.	7.15c
Marquette Paper Co.	6.88c
Enterprise Paper Co.	7.84c
Paper Corp. of U. S.	7.23c

No. 71—60,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 18; flat, cut 21x32, 22x34, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 5,000 lbs.

Import Paper Co.	7.45c[a]
Old Dominion Paper Co.	7.744c
Graham Paper Co.	7.40c
Bradner Smith & Co.	8.45c
R. P. Andrews Paper Co.	7.75c
Whitaker Paper Co.	8.15c
Enterprise Paper Co.	8.575c
Paper Corp. of U. S.	8.00c

([a] Less 2 per cent 30 days.)

50 Per Cent Rag Manifold, White and Colored

No. 73—150,000 lbs., white, No. 14; flat, cut 21x32, 22x34, 28x34 and 38x48 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order 5,000 lbs.

Barton, Duer & Koch Paper Co.	15.45c
R. P. Andrews Paper Co.	16.20c
Marquette Paper Co.	15.00c

No. 74—600,000 lbs., white, No. 18; flat, cut 21x32, 22x34, 24x38 and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size.

Graham Paper Co.	14.25c
Stanford Paper Co.	11.22c
	13.00c
Butler Co.	12.77c
Barton, Duer & Koch Paper Co.	11.28c
R. P. Andrews Paper Co.	11.93c
Marquette Paper Co.	13.50c
Lee Paper Co.	11.45c
Paper Corp. of U. S.	12.99c

No. 75—15,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 14; flat, cut 21x32, 22x34, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 3,000 lbs.

Barton, Duer & Koch Paper Co.	18.45c
R. P. Andrews Paper Co.	19.85c
Marquette Paper Co.	17.25c

No. 76—80,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 18; flat, cut 21x32, 22x34, 24x38 and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 5,000 lbs.

Graham Paper Co.	15.20c
Barton, Duer & Koch Paper Co.	12.38c
R. P. Andrews Paper Co.	12.69c
Marquette Paper Co.	12.70c
Lee Paper Co.	12.11c

100 Per Cent Rag White Manifold

No. 78—5,000 lbs., No. 14; flat, cut 17x28, 19x24, 21x32, and 22x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, 5,000 lbs.

Old Dominion Paper Co.	25.92c
Barton, Duer & Koch Paper Co.	2588c
Frank Parsons Paper Co.	25.90c
Whitaker Paper Co.	30.00c

No. 79—20,000 lbs., No. 18; flat, cut 17x28, 19x24, 21x32 and 22x34 ins.; the grain to run the 21-inch way on the 21x32 ins. size. Min. order 5,000 lbs.

Old Dominion Paper Co.	21.108c
Butler Co.	21.36c
Barton, Duer & Koch Paper Co.	22.15c
R. P. Andrews Paper Co.	23.20c
Whitaker Paper Co.	26.00c
Lee Paper Co.	24.36c

50 Per Cent Rag White Glazed Manifold

No. 83—100,000 lbs., No. 16; flat cut 19x24 and 21x32 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order 20,000 lbs.

Barton, Duer & Koch Paper Co.	14.64c
R. P. Andrews Paper Co.	14.67c
Lee Paper Co.	17.99c

Sulphite White Bond

No. 102—600,000 lbs., No. 40; flat, cut any size, min. width 21 ins.; max. width 34 ins.

Barton, Duer & Koch Paper Co.	5.58c
Whitaker Paper Co.	5.39c
Aetna Paper Co.	5.48c
Paper Corp. of U. S.	5.96c

25 Per Cent Rag Bond, White and Colored

No. 109—400,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins., max. width 34 ins.

Graham Paper Co.	11.05c
Butler Co.	9.24c
Barton, Duer & Koch Paper Co.	9.65c
R. P. Andrews Paper Co.	9.39c
Aetna Paper Co.	9.098c

No. 110—400,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 34 ins.

Butler Co.	7.81c
Barton, Duer & Koch Paper Co.	8.25c
Aetna Paper Co.	7.678c

No. 111—1,500,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 34 ins.

Butler Co.	7.131c
Barton, Duer & Koch Paper Co.	8.10c
Aetna Paper Co.	7.238c

No. 112—1,500,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 34 ins.

Barton Duer & Koch Paper Co.	8.05c
Aetna Paper Co.	7.238c

No. 113—350,000 lbs., white, No. 48; flat, cut any size, min. width 21 ins., max. width 34 ins.

Barton, Duer & Koch Paper Co.	8.00c
R. P. Andrews Paper Co.	7.21c
Mathers-Lamm Paper Co.	7.385c
Aetna Paper Co.	7.148c

No. 114—200,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 26; flat, cut any size, min. width 21 ins., max. width 34 ins. Min. order, one color, 5,000 lbs.

Baxter Paper Co.	9.39c
Stanford Paper Co.	10.27c
Barton, Duer & Koch Paper Co.	9.90c
Aetna Paper Co.	9.488c

No. 115—400,000 lbs., blue, buff, cherry, green, pink, salmon and yellow. No. 32; flat, cut any size, min. width 21 ins., max. width 34 ins.

Stanford Paper Co.	8.27c
Barton, Duer & Koch Paper Co.	8.40c
Aetna Paper Co.	7.848c

No. 116—400,000 lbs., blue, buff, cherry, green, pink, salmon and yellow No. 40; flat, cut any size min. width 21 ins., max. width 34 ins.

Mudge Paper Co.	7.92c
Stanford Paper Co.	7.97c
Barton, Duer & Koch Paper Co.	8.35c
Aetna Paper Co.	7.468c

No. 117—100,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 48; flat, cut any size, min. width 21 ins., max. width 34 ins.

Graham Paper Co.	7.71c
Mudge Paper Co.	7.92c
Stanford Paper Co.	7.97c
Barton, Duer & Koch Paper Co.	8.30c
Aetna Paper Co.	7.468c

50 Per Cent Rag Bond, White and Colored

No. 120—30,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins., max. width 34 ins.

Graham Paper Co.	11.39c
Butler Co.	11.49c
Barton, Duer & Koch Paper Co.	11.20c
R. P. Andrews Paper Co.	13.70c
Aetna Paper Co.	11.188c

No. 121—800,000 lbs., white, Nos. 32 and 40; flat, cut any size, min. width 21 ins., max. width 34 ins.

Butler Co.	8.99c
Barton, Duer & Koch Paper Co.	9.25c
R. P. Andrews Paper Co.	11.07c
Mathers-Lamm Paper Co.	8.744c
Aetna Paper Co.	8.588c

No. 122—100,000 lbs., white, No. 48; flat, cut any size, min. width 21 ins., max. width 34 ins.

Graham Paper Co.	8.79c
Baxter Paper Co.	8.79c
Stanford Paper Co.	9.07c
Butler Co.	9.03c
Barton, Duer & Koch Paper Co.	9.25c
R. P. Andrews Paper Co.	11.07c
Aetna Paper Co.	8.548c
Virginia Paper Co.	8.94c

No. 123—10,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 32 and 40; flat, cut any size, min. width 21 ins., max. width 34 ins. Min. order, one color, one substance, 2,500 lbs.

Graham Paper Co.	13.35c
Barton, Duer & Koch Paper Co.	10.40c
Aetna Paper Co.	9.788c

75 Per Cent Rag White Bond

No. 125—2,500 lbs., No. 26; flat, cut any size, min. width 21 ins., max. width 32 ins. Min. order, 2,500 lbs.

Graham Paper Co.	22.10c
Stanford Paper Co.	17.98c
Schapiro Paper Co.	22.10c

No. 126—2,500 lbs., Nos. 32, 40, and 48; flat, cut any size, min. width 21 ins., max. width 32 ins. Min. order, one substance, 2,500 lbs.

Graham Paper Co.	18.39c
Stanford Paper Co.	14.68c
Schapiro Paper Co.	18.39c

100 Per Cent Rag White Bond

No. 128—7,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 16 ins., max. width 32 ins. Min. order, one substance, 2,000 lbs.

Stanford Paper Co.	18.13c
Barton, Duer & Koch Paper Co.	18.63c
R. P. Andrews Paper Co.	21.749c
Whitaker Paper Co.	26.62c

No. 129—5,000 lbs., No. 48; flat, cut any size, min. width 16 ins., max. width 32 ins. Min. order, 2,000 lbs.

100 Per Cent Rag Declaration Bond

Stanford Paper Co.	18.13c
Barton, Duer & Koch Paper Co.	18.63c
R. P. Andrews Paper Co.	21.749c
Whitaker Paper Co.	25.93c

No. 140—6,000 lbs., Nos. 32 and 40; flat, cut 17x22 and 22x25½ ins. Min. order, one substance, 3,000 lbs.

Graham Paper Co.	29.391c
Stanford Paper Co.	21.13c
Schapiro Paper Co.	29.391c

100 Per Cent Rag Parchment Deed

No. 141—2,000 lbs., No. 64; flat, cut 33x34 ins. Min. order, 2,000 lbs.

Stanford Paper Co.	18.23c
Barton, Duer & Koch Paper Co.	19.13c
R. P. Andrews Paper Co.	22.73c

Sulphite White Ledger

No. 151—100,000 lbs., Nos. 56 and 64; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order, one substance, 10,000 lbs.

Walker-Goulard-Plehn Co.	5.9694c
Stanford Paper Co.	5.749c
Whitaker Paper Co.	6.25c
Aetna Paper Co.	6.18c
Marquette Paper Co.	5.74c
Paper Corp. of U. S.	6.60c

No. 152—80,000 lbs., No. 80; flat, cut any size, min. width 17 ins., max. width 32 ins.

Walker-Goulard-Plehn Co.	5.9694c
Stanford Paper Co.	5.749c
Whitaker Paper Co.	5.25c
Aetna Paper Co.	5.18c
Marquette Paper Co.	5.74c
Paper Corp. of U. S.	6.60c

25 Per Cent Rag Ledger, White and Colored

No. 154—80,000 lbs., white, Nos. 48 and 56; flat, cut 20x28, 21x32, 24x38, 28x29 and 28x34 ins. Min. order, one substance, 5,000 lbs.

Graham Paper Co.	12.60c
Mudge Paper Co.	8.33c
Butler Co.	8.11c
Barton, Duer & Koch Paper Co.	9.00c
R. P. Andrews Paper Co.	7.67c
Aetna Paper Co.	8.148c
Virginia Paper Co.	8.38c
Paper Corp. of U. S.	8.52c

No. 155—5,000 lbs., white, No. 64; flat, cut 21x32 and 23x36 ins. Min. order, 5,000 lbs.

Mudge Paper Co.	8.76c
Walker-Goulard?-Plehn Co.	8.99c
Butler Co.	8.64c
Barton, Duer & Koch Paper Co.	9.00c
R. P. Andrews Paper Co.	8.55c
Mathers-Lamm Paper Co.	8.588c
Aetna Paper Co.	8.488c
Paper Corp. of U. S.	8.92c

No. 156—20,000 lbs., white, No. 72; flat, cut 20x28, 21x32, 24x38, and 28x34 ins. Min. order, 5,000 lbs.

Mudge Paper Co.	8.76c
Walker-Goulard-Plehn Co.	8.99c
Butler Co.	8.64c
Barton, Duer & Koch Paper Co.	9.00c
R. P. Andrews Paper Co.	8.588c
Aetna Paper Co.	8.488c
Paper Corp. of U. S.	8.92c

No. 157—30,000 lbs., blue, buff, green, pink, salmon and yellow, Nos. 56, 64, and 72; flat, cut 21x32, 23x36, 24x38, 26x36, and 28x34 ins. Min. order, one substance, one color, 3,000 lbs.

Graham Paper Co.	13.60c
Walker-Goulard-Plehn Co.	9.386c
Butler Co.	9.072c
Barton, Duer & Koch Paper Co.	9.25c
R. P. Andrews Paper Co.	9.87c
Mathers-Lamm Paper Co.	9.488c
Aetna Paper Co.	8.988c

50 Per Cent Rag Ledger, White and Colored

No. 160—120,000 lbs., white, Nos. 48 and 56; flat, cut 18½x36, 18½x40¼, 20x28, 21x32, 24x38, 28x29, and 28x34 ins. Min. order, one substance, 10,000 lbs.

Graham Paper Co.	9.07c
Mudge Paper Co.	9.81c
Butler Co.	9.13c
Barton, Duer & Koch Paper Co.	9.45c
R. P. Andrews Paper Co.	11.00c
Mathers-Lamm Paper Co.	9.69c
Aetna Paper Co.	8.978c
Paper Corp. of U. S.	9.61c

No. 161—30,000 lbs., white, No. 64; flat, cut 21x32 and 23x36 ins. Min. order, 10,000 lbs.

Graham Paper Co.	9.17c
Mudge Paper Co.	9.81c
Butler Co.	9.33c
Schapiro Paper Co.	10.84c
Barton, Duer & Koch Paper Co.	9.45c
R. P. Andrews Paper Co.	11.00c
Aetna Paper Co.	8.978c
Virginia Paper Co.	9.78c
Paper Corp. of U. S.	9.61c

No. 162—150,000 lbs., white, Nos. 72 and 80; flat, cut 20x28, 21x32, 24x38, and 28x34 and 36½x48½ ins.; on size 36½x48½ the grain to run crosswise of the sheet. Min. order, 10,000 lbs.

Graham Paper Co.	8.97c
Butler Co.	9.53c
Barton, Duer & Koch Paper Co.	9.39c
R. P. Andrews Paper Co.	11.00c
Aetna Paper Co.	9.658c
Virginia Paper Co.	9.78c
Paper Corp. of U. S.	9.61c

No. 163—30,000 lbs., white. No. 88; flat, cut 21x32½ ins. Min. order, 10,000 lbs.

Mudge Paper Co.	9.79c
Baxter Paper Co.	9.37c
Butler Co.	9.54c
Barton, Duer & Koch Paper Co.	9.45c
R. P. Andrews Paper Co.	11.00c
Aetna Paper Co.	9.468c
Paper Corp. of U. S.	10.01c

No. 164—80,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 56, 64, and 72; flat cut 18½x36, 18½x40¼, 19x24, 21x32, 23x36, and 28x34 ins. Min. order, one substance, one color, 5,000 lbs.

Graham Paper Co.	13.70c
Mudge Paper Co.	10.11c
Baxter Paper Co.	9.73c
Butler Co.	9.98c
Barton, Duer & Koch Paper Co.	9.70c
Aetna Paper Co.	9.478c

No. 165—20,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow. No. 88; flat, cut 21x32½ ins. Min. order, one color, 5,000 lbs.

Graham Paper Co.	13.70c
Mudge Paper Co.	10.11c
Baxter Paper Co.	9.73c
Butler Co.	9.98c
Barton, Duer & Koch Paper Co.	9.70c
Aetna Paper Co.	9.978c

75 Per Cent Rag Ledger, White and Colored

No. 168—10,000 lbs., white, Nos. 48 and 56; flat, cut 21x32, 24x38, 28x29, and 28x34 ins. Min. order, one substance, 4,000 lbs.

Stanford Paper Co.	14.00c
Butler Co.	13.17c
Schapiro Paper Co.	15.93c
Barton, Duer & Koch Paper Co.	13.04c
R. P. Andrews Paper Co.	13.07c
Frank Parsons Paper Co.	14.44c
Whitaker Paper Co.	16.36c
Aetna Paper Co.	13.358c

No. 169—10,000 lbs., white, No. 64; flat, cut 21x32, 23x36,24x38, and 28x34 ins. Min. order, 5,000 lbs.

Graham Paper Co.	16.25c
Stanford Paper Co.	14.00c
Butler Co.	13.17c
Schapiro Paper Co.	15.93c
Barton, Duer & Koch Paper Co.	13.04c
R. P. Andrews Paper Co.	12.87c
Frank Parsons Paper Co.	14.44c
Whitaker Paper Co.	16.16c
Aetna Paper Co.	13.358c

No. 170—10,000 lbs., white, Nos. 72 and 80; flat, cut 20x28, 21x32, 24x38, and 28x34 ins. Min. order, one substance, 5,000 lbs.

Graham Paper Co.	16.75c
Stanford Paper Co.	14.00c
Butler Co.	13.17c
Barton, Duer & Koch Paper Co.	13.04c
R. P. Andrews Paper Co.	12.87c
Frank Parsons Paper Co.	14.44c
Whitaker Paper Co.	16.56c
Aetna Paper Co.	13.358c

No. 171—10,000 lbs., white, No. 88; flat, cut 21x32½ ins. Min. order, 5,000 lbs.

Graham Paper Co.	16.75c
Stanford Paper Co.	14.00c
Butler Co.	13.17c
Barton, Duer & Koch Paper Co.	13.04c
R. P. Andrews Paper Co.	12.87c
Frank Parsons Paper Co.	14.44c
Whitaker Paper Co.	16.78c
Aetna Paper Co.	13.358c

No. 172—10,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 56, 64, and 72; flat, cut 21x32, 23x36, 24x38, and 28x34 ins. Min. order, one substance, one color, 3,000 lbs.

Graham Paper Co.	16.75c
Baxter Paper Co.	13.91c
Stanford Paper Co.	14.50c
Butler Co.	14.02c
Barton, Duer & Koch Paper Co.	13.95c
Frank Parsons Paper Co.	15.18c
Whitaker Paper Co.	18.86c
Aetna Paper Co.	14.108c

No. 173—6,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow, No. 88; flat, cut 21x32½ ins. Min. order, one color, 4,000 lbs.

Graham Paper Co.	16.75c
Baxter Paper Co.	14.23c
Stanford Paper Co.	14.50c
Butler Co.	14.02c
Barton, Duer & Koch Paper Co.	13.95c
Frank Parsons Paper Co.	15.18c
Whitaker Paper Co.	19.66c
Aetna Paper Co.	14.108c

100 Per Cent Rag White Ledger

No. 176—5,000 lbs., No. 48; flat, cut 21x32, 22¾x31½, 23x36, 24x38, and 28x34 ins. Min. order, 4,000 lbs.

Old Dominion Paper Co.	18.144c
Walker-Goulard-Plehn Co.	18.40c
Stanford Paper Co.	18.38c
Butler Co.	17.58c
Barton, Duer & Koch Paper Co.	17.85c
R. P. Andrews Paper Co.	19.08c
Frank Parsons Paper Co.	18.33c
Whitaker Paper Co.	23.15c

No. 177—10,000 lbs., No. 56; flat, cut 20x28, 21x32, 23x36, 24x38, and 28x34 ins. Min. order 5,000 lbs.

Old Dominion Paper Co.	18.144c
Walker-Goulard-Plehn Co.	18.40c
Stanford Paper Co.	18.38c
Butler Co.	17.58c
Barton, Duer & Koch Paper Co.	17.85c
R. P. Andrews Paper Co.	19.08c
Frank Parsons Paper Co.	18.33c
Whitaker Paper Co.	23.15c

No. 178—20,000 lbs., No. 64; flat, cut 18½x42, 21x32, 23x36, and 28x34 ins. Min. order, 5,000 lbs.

Old Dominion Paper Co.	18.144c
Walker-Goulard-Plehn Co.	18.40c
Stanford Paper Co.	18.38c
Butler Co.	17.58c
Barton, Duer & Koch Paper Co.	17.85c
R. P. Andrews Paper Co.	19.08c
Frank Parsons Paper Co.	18.33c
Whitaker Paper Co.	23.41c

No. 179—10,000 lbs., No. 72; flat, cut 20x28, 21x32, 24x38, and 28x34 ins. Min. order, 5,000 lbs.

Old Dominion Paper Co.	18.144c
Walker-Goulard-Plehn Co.	18.40c
Stanford Paper Co.	18.21c
Butler Co.	17.58c
Barton, Duer & Koch Paper Co.	17.85c
R. P. Andrews Paper Co.	19.08c
Frank Parsons Paper Co.	18.33c
Whitaker Paper Co.	23.65c

No. 180—6,000 lbs., No. 80; flat, cut 21x32½ and 21x42 ins. Min. order, 4,000 lbs.

Old Dominion Paper Co.	18.144c
Mudge Paper Co.	18.34c
Walker-Goulard-Plehn Co.	18.40c
Stanford Paper Co.	18.21c
Butler Co.	17.58c
Barton, Duer & Koch Paper Co.	17.85c
R. P. Andrews Paper Co.	19.08c
Frank Parsons Paper Co.	18.33c
Whitaker Paper Co.	23.65c

No. 181—15,000 lbs., No. 88; flat, cut 20½x24¾, 21x32½ and 22¾x31½ ins. Min. order, 5,000 lbs.

Old Dominion Paper Co.	18.144c
Mudge Paper Co.	18.34c
Walker-Goulard-Plehn Co.	18.40c
Stanford Paper Co.	18.21c
Butler Co.	17.58c
Barton, Duer & Koch Paper Co.	17.85c
R. P. Andrews Paper Co.	19.08c
Frank Parsons Paper Co.	18.33c
Whitaker Paper Co.	23.91c

Sulphite White Index

No. 184—300,000 lbs., 22½x28½—182 and 230; flat, cut 21x32½, 22½x28½, and 24½x32½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

Old Dominion Paper Co.	5.828c
Graham Paper Co.	5.72c
Walker-Goulard-Plehn Co.	6.786c
Stanford Paper Co.	5.749c
Barton, Duer & Koch Paper Co.	5.13c
R. P. Andrews Paper Co.	6.35c
Whitaker Paper Co.	6.31c
Marquette Paper Co.	5.129c
Virginia Paper Co.	5.73c

50 Per Cent Rag Index, White and Colored

No. 190—400,000 lbs., white, 22½x28½—182 and 230; flat, cut 21x32½, 22½x28½ and 24½x32½ ins, with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

Graham Paper Co.	9.84c
Stanford Paper Co.	12.11c
Barton, Duer & Koch Paper Co.	8.95c
R. P. Andrews Paper Co.	11.57c
Frank Parsons Paper Co.	12.60c
Whitaker Paper Co.	14.29c
Aetna Paper Co.	8.878c
Marquette Paper Co.	9.85c

No. 191—25,000 lbs., white, 22½x28½—280 and 362; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 5,000 lbs.

Stanford Paper Co.	12.11c
Walker-Goulard-Plehn Co.	11.74c
Barton, Duer & Koch Paper Co.	11.95c
Frank Parsons Paper Co.	12.60c
Marquette Paper Co.	11.70c

No. 192—250,000 lbs., blue, buff, fawn, green, pink, salmon and yellow, 22½x28½—182 and 230; flat, cut 21x32½ and 22½x28½ ins, with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

Graham Paper Co.	9.98c
Stanford Paper Co.	12.36c
Barton, Duer & Koch Paper Co.	9.29c
Frank Parsons Paper Co.	13.34c
Whitaker Paper Co.	15.29c
Aetna Paper Co.	8.978c
Marquette Paper Co.	9.95c

No. 193—20,000 lbs., blue, buff, fawn, green, pink, salmon and yellow, 22½x28½—280 and 362; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

Walker-Goulard-Plehn Co.	12.09c
Stanford Paper Co.	12.36c
Barton, Duer & Koch Paper Co.	12.26c
Frank Parsons Paper Co.	13.34c
Marquette Paper Co.	11.90c

100 Per Cent Rag White Index

No. 196—80,000 lbs., 22½x28½—approximately 206; flat, cut 20½x30½ and 21x32½ ins.

Mudge Paper Co.	17.27c
Walker-Goulard-Plehn Co.	17.41c
Stanford Paper Co.	18.33c
Barton, Duer & Koch Paper Co.	16.85c
R. P. Andrews Paper Co.	18.99c
Frank Parsons Paper Co.	17.56c
Whitaker Paper Co.	22.12c
Mathers-Lamm Paper Co.	18.37c
Marquette Paper Co.	17.00c
Lee Paper Co.	17.20c

White Tissue

No. 197—1,500 lbs., flat, 21x32—18. Min. order 1,000 lbs.

A. Hartung & Co.	9.61c
R. P. Andrews Paper Co.	10.94c
Mathers-Lamm Paper Co.	10.45c

Facing Stereo Tissue

No. 198—500 lbs., 19x24—9; rolls 24 ins. wide (3-inch fiber cores). Min. order, 500 lbs.

No bid.

Coated Cover, White and Colored

No. 201—30,000 lbs., white, 20x26—130 and 160; flat, 26½x41 ins., the grain to run lengthwise of the sheet. Min. order, 5,000 lbs.

Graham Paper Co.	7.15c
John F. Post, Inc.	6.45c
Stanford Paper Co.	6.74c
Barton, Duer & Koch Paper Co.	7.08c
Whitaker Paper Co.	6.85c
Enterprise Paper Co.	7.068c
Virginia Paper Co.	7.11c

No. 202—25,000 lbs., India tint, light green, and emerald green, 20x26—100; flat, 26½x41 ins.

Graham Paper Co.	7.85c
John F. Post, Inc.	6.85c
	7.45c
	8.00c
Stanford Paper Co.	7.71c
Barton, Duer & Koch Paper Co.	7.77c
Whitaker Paper Co.	7.85c
Enterprise Paper Co.	7.75c
Virginia Paper Co.	7.81c

Machine-Finish Cover, White and Colored

No. 203—160,000 lbs., antique; white, dawn, quaker drab, robin's egg, terra cotta, light blue, dark blue, buff, gold, cream, light gray, dark gray, light brown, dark brown, light green, dark green, sage, gobelin blue, and coral red; flat, 20x25—96, in wrapped bundles with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,500 lbs.

Graham Paper Co.	9.67c
Stanford Paper Co.	7.10c
R. P. Andrews Paper Co.	7.41c
Whitaker Paper Co.	7.21c
Marquette Paper Co.	7.32c

No. 204—80,000 lbs., smooth; white, blue, brown, granite, green, pink, tea and yellow, 20x26—100; flat cut 20x25 and 33x46 ins., in wrapped bundles, with projecting colored-paper marker between each 500 sheets. Min. order, one color, 5,000 lbs.

Graham Paper Co..... 8.74c
Stanford Paper Co..... 7.00c
R. P. Andrews Paper Co..... 7.30c
Whitaker Paper Co..... 7.21c
Marquette Paper Co..... 7.21c

50 Per Cent Rag Laid Cover, Colored

No. 205—50,000 lbs., blue, cream, white, gray and green, 20x26—130; flat, cut 20x25, 22x33 and 28x41 ins., in wrapped bundles, with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,000 lbs.

Graham Paper Co..... 12.93c
R. P. Andrews Paper Co..... 10.87c
Lee Paper Co..... 10.37c

Wood Manila

No. 209—200,000 lbs., 24x36—80 to 120; flat, cut 21x32, 22½x34½, 25x38 and 32x36 ins., in wrapped bundles with projecting colored-paper marker between each 500 sheets.

Old Dominion Paper Co..... 3.9379c
Barton, Duer & Koch Paper Co.. 3.98c
Paper Corp. of U. S..... 4.24c

No. 210—200,000 lbs., 24x36—80 to 120; rolls, 18 and 21 ins. wide (3-inch fiber cores).

Old Dominion Paper Co. 3.6878c
Barton, Duer & Koch Paper Co.. 3.73c
Paper Corp. of U. S..... 3.99c

Chemical Wood Manila

No. 211—30,000 lbs., 24x36—100 to 160; flat, cut any size in wrapped bundles. Min. order, one weight, 5,000 lbs.

Old Dominion Paper Co..... 5.279c
Graham Paper Co..... 5.10c
Butler Co..... 5.05c
Barton, Duer & Koch Paper Co... 5.20c
R. P. Andrews Paper Co..... 4.95c

Rope Manila

No. 213—10,000 lbs., 24x36—120, 140, and 160; rolls, 18 and 48 ins. wide (3-inch fiber cores). Min. order, 5,000 lbs.

R. P. Andrews Paper Co..... 15.80c

No. 214—10,000 lbs., 24x36—280; rolls, 48 ins. wide (3-inch fiber cores). Min. order, 5,000 lbs.

R. P. Andrews Paper Co..... 14.80c

Drumhead Manila

No. 215—10,000 lbs., 24x36—280; flat, cut 26x42 ins. Min. order, 5,000 lbs.

Mudge Paper Co..... 14.75c

No. 2 Kraft

No. 217—300,000 lbs., 24x36—80 to 160; flat, cut any size in wrapped bundles.

Old Dominion Paper Co..... 3.5244c
Perkins-Goodwin Co. 3.56c
Walker-Goulard-Plehn Co..... 3.62c
Barton, Duer & Koch Paper Co.. 4.00c
Whitaker Paper Co..... 3.51c
Cauthorne Paper Co..... 3.52c
Enterprise Paper Co..... 3.549c
Andrews Paper House of York... 3.56c
Paper Corp. of U. S..... 3.372c

No. 218—200,000 lbs., 24x36—80 to 160; cut any size, folded (25 sheets per fold), in wrapped bundles.

Old Dominion Paper Co..... 3.5244c
Perkins-Goodwin Co..... 3.56c
Walker-Goulard-Plehn Co..... 3.62c
Barton, Duer & Koch Paper Co... 4.00c
Whitaker Paper Co..... 3.51c
Cauthorne Paper Co..... 3.52c
Enterprise Paper Co..... 3.549c
Andrews Paper House of York... 3.56c
Paper Corp. of U. S..... 3.372c

No. 219—350,000 lbs., 24x36—80 to 160; rolls, 9, 10½, 11½, 24, 36, 39, and 48 ins. wide, wound on wooden plugs, 1½-inch hole, or on 3-inch fiber cores as may be specified.

Old Dominion Paper Co..... 3.2869c
Perkins-Goodwin Co..... 3.31c
Walker-Goulard-Plehn Co..... 3.37c
Barton, Duer & Koch Paper Co.. 3.75c
Whitaker Paper Co..... 3.26c
Cauthorne Paper Co..... 3.28c
Enterprise Paper Co..... 3.29c
Andrews Paper House of York... 3.31c
Paper Corp. of U. S..... 3.124c

No. 1 Kraft

No. 220—5,000 lbs., 24x36—120 and 160; flat, cut any size in wrapped bundles.

No bids.

White Paraffin

No. 251—1,500 lbs., flat, 24x38—32. Min. order, 1,000 lbs.

Walker-Goulard-Plehn Co..... 11.00c
R. P. Andrews Paper Co..... 9.75c
Enterprise Paper Co..... 9.555c

White Gummed

No. 252—400,000 sheets, flat, 17x22—40, exclusive of weight of gum used. Min. order, 50,000 sheets.

	Per M. Sheets
Old Dominion Paper Co.....	$4.938
Graham Paper Co.....	4.99
Mudge Paper Co.....	5.30
Alling & Cory Co.	5.08
Walker-Goulard-Plehn Co.....	4.99
Stanford Paper Co.....	5.08
Barton, Duer & Koch Paper Co...	5.60
R. P. Andrews Paper Co.....	5.04
Cauthorne Paper Co.	4.798
Enterprise Paper Co.....	4.939
Andrews Paper House of York....	4.99
Virginia Paper Co.....	4.845

Blotting, White and Colored

No. 254—16,000 lbs., white, flat, 19x24-160, in wrapped bundles. Min. order, 4,000 lbs.

Graham Paper Co..... 5.00c
Bradner Smith & Co..... 5.00c
Alling & Cory Co. 5.00c
L. Hyman & Sons..... 4.99c
Stanford Paper Co..... 4.98c
Butler Co..... 4.946c
Barton, Duer & Koch Paper Co... 5.29c
R. P. Andrews Paper Co..... 5.23c
Whitaker Paper Co..... 5.03c
Cauthorne Paper Co..... 5.248c

No. 255—2,000 lbs., buff and salmon, flat, 19x24—160, in wrapped bundles. Min. order, 2,000 lbs.

Graham Paper Co..... 5.31c
Bradner Smith & Co..... 5.31c
Alling & Cory Co. 5.31c
L. Hyman & Sons..... 5.30c
Stanford Paper Co..... 5.29c
Butler Co..... 5.246c
Barton, Duer & Koch Paper Co... 5.29c
R. P. Andrews Paper Co..... 5.23c
Whitaker Paper Co..... 5.21c
Cauthorne Paper Co..... 5.248c

25 Per Cent Rag Blotting, White and Colored

No. 256—10,000 lbs., white, flat, 19x24—160, in wrapped bundles. Min. order, 10,000 lbs.

Graham Paper Co..... 6.05c
A. Hartung & Co..... 6.50c
Bradner Smith & Co..... 6.05c
Alling & Cory Co. 6.05c
L. Hyman & Sons..... 6.04c
Stanford Paper Co..... 6.03c
Butler Co..... 6.031c
Barton, Duer & Koch Paper Co... 6.25c
R. P. Andrews Paper Co..... 6.59c
Whitaker Paper Co..... 6.71c
Cauthorne Paper Co..... 6.22c

No. 257—6,000 lbs., buff and salmon, flat, 19x24—160, in wrapped bundles. Min. order, one color, 2,000 lbs.

Graham Paper Co..... 6.60c
A. Hartung & Co..... 6.65c
Bradner Smith & Co..... 6.60c
Alling & Cory Co. 6.60c
L. Hyman & Sons..... 6.59c
Stanford Paper Co..... 6.58c
Butler Co. 6.582c
Barton, Duer & Koch Paper Co... 6.65c
R. P. Andrews Paper Co..... 6.79c
Whitaker Paper Co..... 6.96c
Cauthorne Paper Co..... 6.62c

Desk Blotting, Colored

No. 258—10,000 lbs., blue and buff, flat, 19x24—200, in wrapped bundles. Min. order, one color, 5,000 lbs.

Graham Paper Co..... 5.31c
Bradner Smith & Co..... 5.31c
Alling & Cory Co. 5.31c
L. Hyman & Sons..... 5.30c
Stanford Paper Co..... 5.29c
Butler Co..... 5.21c
Barton, Duer & Koch Paper Co... 5.10c
R. P. Andrews Paper Co..... 5.19c
Whitaker Paper Co..... 5.21c
Cauthorne Paper Co..... 5.08c

No. 259—80,000 lbs., moss-green, flat, 19x24—200, in wrapped bundles. Min. order, 10,000 lbs.

Graham Paper Co..... 5.10c
A. Hartung & Co..... 5.643c
Bradner Smith & Co..... 5.10c
Alling & Cory Co. 5.10c
L. Hyman & Sons..... 5.09c
Stanford Paper Co..... 5.05c
Butler Co..... 5.031c
Barton, Duer & Koch Paper Co... 4.63c
R. P. Andrews Paper Co..... 5.03c
Whitaker Paper Co..... 5.21c
Cauthorne Paper Co..... 4.61c

White Stereotype Molding

No. 260—1,500 lbs., 19x24—120; rolls, 24 ins. wide (3-inch fiber cores). Min. order, 1,000 lbs.

Graham Paper Co..... 8.04c
Bradner Smith & Co..... 8.04c
Alling & Cory Co. 8.04c
L. Hyman & Sons..... 8.03c
Stanford Paper Co..... 8.02c
Butler Co..... 8.04c

Red Stereotype Molding

No. 261—1,500 lbs., 19x24—40; rolls, 24 ins. wide (3-inch fiber cores). Min. order, 1,000 lbs.

Graham Paper Co..... 10.61c
Bradner Smith & Co..... 10.61c
Alling & Cory Co. 10.61c
L. Hyman & Sons..... 10.60c
Stanford Paper Co..... 10.59c
Butler Co..... 10.61c

Oiled Manila Tympan

No. 262—20,000 lbs., 24x36—approximately 210; rolls, 38 and 48 ins. wide; 10-inch diameter; wound on wooden plugs, 1½-inch hole. Min. order, 5,000 lbs.

Graham Paper Co..... 7.10c
Mudge Paper Co..... 7.10c
Cromwell Paper Co..... 7.50c
Link Paper Co..... 6.70c
Mathers-Lamm Paper Co..... 7.04c

Plate-Wiping, for Embossing Presses

No. 263—3,000 lbs., 24x36—100; rolls, 24 ins. wide (3-inch fiber cores). Min. order, 1,000 lbs.

Barton, Duer & Koch Paper Co. .. 7.00c

Back-Lining, for Case-Making Machines

No. 264—3,000 lbs., 24x36—180; rolls, 24 ins. diameter, 37 ins. wide (3-inch fiber cores). Min. order, 2,000 lbs.

Barton, Duer & Koch Paper Co.... 3.40c

High-Finish Red Sulphite

No. 265—10,000 lbs., flat, 24x36—320 and 400, in wrapped bundles. Min. order, 5,000 lbs.

Mudge Paper Co.	6.50c
Whitaker Paper Co.	6.33c

High-Finish Sulphite Manila Tag

No. 271—80,000 lbs., 24x36—160 to 280; flat, cut any size, min. width 24 ins., max. width 38 ins., in wrapped bundles.

Old Dominion Paper Co.	5.288c
R. P. Andrews Paper Co.	5.25c
Whitaker Paper Co.	5.47c
Marquette Paper Co.	5.79c
Paper Corp. of U. S.	5.10c

Calendered Tag, Manila and Colored

No. 276—1,000,000 lbs., manila, 22½x28½—approximately 148; rolls, 23¼ and 26½ ins. wide (6-inch iron cores).

Fitchburg Paper Co.	6.47c
Barton, Duer & Koch Paper Co.	6.73c

No. 277—300,000 lbs., blue, brown, green, pink, red, salmon and yellow, 22½x28½—approximately 148; rolls, 23¼ and 26½ in. wide (6-inch iron cores). Min. order, one color, 10,000 lbs.

Fitchburg Paper Co.	7.47c
Barton, Duer & Koch Paper Co.	7.73c

Jute Tag

No. 280—40,000 lbs., 22½x28½—200 and 280; flat, cut 22½x28½ ins., in wrapped bundles. Min. order, one weight, 10,000 lbs.

Mudge Paper Co.	7.55c
Resolute Paper Products Co.	13.00c
	13.67c
Whitaker Paper Co.	7.75c

Manila Board

No. 281—30,000 lbs., 22½x28½—400; flat, cut 17x28, 21x32, and 22½x28½ ins., in wrapped bundles with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

No bids.

Railroad Board, White and Colored

No. 302—80,000 sheets, white, flat, 22x28 ins., 4-ply, each 100 sheets fully banded, packed in wooden cases. Min. order, 10,000 sheets.

	Per M sheets
Old Dominion Paper Co.	$22.979
Graham Paper Co.	21.60
A. Hartung & Co.	22.27
Stanford Paper Co.	21.99
Barton, Duer & Koch Paper Co.	21.65
R. P. Andrews Paper Co.	22.19
Whitaker Paper Co.	21.45
Enterprise Paper Co.	21.63
Virginia Paper Co.	21.85
Paper Corp. of U. S.	21.95

No. 303—10,000 sheets, white, flat, 22x28 ins., 8-ply, each 100 sheets fully banded, packed in wooden cases. Min. order, 5,000 sheets.

	Per M sheets
Old Dominion Paper Co.	$34.897
Graham Paper Co.	32.45
A. Hartung & Co.	35.41
Stanford Paper Co.	35.06
Barton, Duer & Koch Paper Co.	32.38
R. P. Andrews Paper Co.	35.24
Whitaker Paper Co.	36.13
Enterprise Paper Co.	32.69
Virginia Paper Co.	32.70
Paper Corp. of U. S.	33.25

No. 304—30,000 sheets, white, flat, 22x28 ins., 14-ply, each 50 sheets fully banded, packed in wooden cases. Min. order, 5,000 sheets.

	Per M sheets
Old Dominion Paper Co.	$46.998
Graham Paper Co.	44.15
A. Hartung & Co.	45.40
Stanford Paper Co.	44.94
Barton, Duer & Koch Paper Co.	43.96
R. P. Andrews Paper Co.	44.94
Whitaker Paper Co.	47.62
Enterprise Paper Co.	43.95
Virginia Paper Co.	44.40
Paper Corp. of U. S.	44.85

No. 305—30,000 sheets, ash gray, blue, buff, green, lemon and orange, flat 22x28 ins. 4-ply, each 100 sheets fully banded, packed in wooden cases. Min. order, one color, 5,000 sheets.

	Per M sheets
Old Dominion Paper Co.	$29.998
Graham Paper Co.	26.75
A. Hartung & Co.	29.03
Stanford Paper Co.	28.71
Barton, Duer & Koch Paper Co.	26.73
Whitaker Paper Co.	29.62
Enterprise Paper Co.	26.73
Virginia Paper Co.	27.00
Paper Corp. of U. S.	28.65

Wood Bristol, Colored

No. 306—200,000 lbs., buff, 22½x28½—150; rolls, 22 ins. wide (6-inch iron cores).

Old Dominion Paper Co.	4.3469c
Barton, Duer & Koch Paper Co.	3.99c

No. 307—40,000 lbs., blue, buff, gray, green, melon, pink, quaker-drab and yellow, flat, 21x31—204; in wrapped bundles with projecting colored-paper marker between each 100 sheets.

Old Dominion Paper Co.	4.3469c
Barton, Duer & Koch Paper Co.	3.99c

No. 308—100,000 lbs., blue, brown, buff, gray, green, melon, pink and yellow, 22½x28½—200; rolls 20 ins. wide (6-inch iron cores).

Old Dominion Paper Co.	4.3469c
Barton, Duer & Koch Paper Co.	3.99c

No. 309—100,000 lbs., blue, brown, buff, gray, green, melon, pink and yellow, 22½x28½—200; rolls 20 ins. wide (6-inch iron cores).

Old Dominion Paper Co.	4.3469c
Barton, Duer & Koch Paper Co.	3.99c

No. 310—60,000 lbs., buff, 22½x28½—200; flat, cut 12x18 and 14½x17½ ins., the grain to run lengthwise of the sheet, in wrapped bundles with projecting colored-paper marker between each 100 sheets.

Old Dominion Paper Co.	4.3469c
Barton, Duer & Koch Paper Co.	3.99c

United States Postal Card Bristol

No. 325—6,000,000 lbs., 22½x28½—188; rolls, 33 ins. wide and 36 ins. in diameter (6-inch iron cores).

Barton, Duer & Koch Paper Co.	4.32c
R. P. Andrews Paper Co.	4.28c
Whitaker Paper Co.	4.33c
Paper Corp. of U. S.	5.088c

Pressboard, Colored

No. 351—20,000 sheets, red, flat, 24x32 ins., thickness .0140 inch. Min. order, 5,000 sheets.

	Per 100 sheets
C. B. Hewitt & Bros., Inc.	$6.60
Walker-Goulard-Plehn Co.	6.41
Barton, Duer & Koch Paper Co.	6.53
Whitaker Paper Co.	6.34
Mathers-Lamm Paper Co.	6.53

No. 352—5,000 sheets, gray, flat, 30x36 ins., thickness .0300 inch. Min. order, 5,000 sheets.

	Per 100 sheets
C. B. Hewitt & Bros., Inc.	$21.12
Old Dominion Paper Co.	16.249
Walker-Goulard-Plehn Co.	20.15
Barton, Duer & Koch Paper Co.	21.75
Whitaker Paper Co.	17.89
Andrews Paper House of York	17.325

News Board

No. 360—6,000 lbs., flat, 26x38 ins., No. 100 (to be trimmed square on four sides). Min. order, 1,000 lbs.

Old Dominion Paper Co.	1.464c
Stanford Paper Co.	1.50c
Barton, Duer & Koch Paper Co.	1.48c
R. P. Andrews Paper Co.	1.455c
Whitaker Paper Co.	1.485c
Enterprise Paper Co.	1.499c
Virginia Paper Co.	1.50c

Chip Board

No. 361—700,000 lbs., 26x38 ins., No. 50, flat; cut 21½x32½, 24½x38, 26x38, 28½x34½, 32½x42½ and 34x44.

Old Dominion Paper Co.	1.2569c
Graham Paper Co.	1.3475c
Mudge Paper Co.	1.36c
Resolute Paper Products Co.	1.375c
Stanford Paper Co.	1.274c
Container Corp. of America	1.1725c
Barton, Duer & Koch Paper Co.	1.25c
R. P. Andrews Paper Co.	1.25c
Whitaker Paper Co.	1.24c
Cauthorne Paper Co.	1.2215c
Enterprise Paper Co.	1.311c
Andrews Paper House of York	1.3175c
Virginia Paper Co.	1.247c

Marble Grained Lined Board

No. 362—15,000 lbs., 26x38 ins., No. 50; flat, cut 22x32 ins.

Mathers-Lamm Paper Co.	4.744c

Strawboard

No. 363—5,000 lbs., flat, 26x38 ins., No. 50.

No bids.

Lined Chip Board

No. 364—5,000 lbs., flat, 26x38 ins., No. 50.

Old Dominion Paper Co.	1.799c
Stanford Paper Co.	1.80c
Barton, Duer & Koch Paper Co.	1.80c
R. P. Andrews Paper Co.	1.80c
Whitaker Paper Co.	1.782c
Enterprise Paper Co.	1.79c
Virginia Paper Co.	1.80c

Lined Box Board

No. 365—36,000 lbs., 26x38 ins., No. 40; flat, cut 24½x34 ins. Min. order 36,000 lbs.

Old Dominion Paper Co.	1.739c
Stanford Paper Co.	1.775c
Barton, Duer & Koch Paper Co.	1.70c
R. P. Andrews Paper Co.	1.77c
Whitaker Paper Co.	1.719c
Virginia Paper Co.	1.753c

Binder's Board, No. 1 Quality

No. 366—200,000 lbs., flat, to trim 25x30 ins., Nos. 16, 18, 20, 25, 30 and 40.

Resolute Paper Products Co.	3.675c
Barton, Duer & Koch Paper Co.	3.575c
R. P. Andrews Paper Co.	3.50c
Mathers-Lamm Paper Co.	3.375c

No. 367 — 100,000 lbs., 25¾x30¾ ins,. Nos. 12 and 20; flat, to trim 34x44 ins.

Resolute Paper Products Co.	3.675c
Barton, Duer & Koch Paper Co.	3.575c
R. P. Andrews Paper Co.	3.50c
Mathers-Lamm Paper Co.	3.375c

Binder's Board, Best Quality

No. 368—80,000 lbs., flat, to trim 20x30 ins., and 22x28 ins., Nos. 18, 20, 25, 30, 35, 40 and 45.

Resolute Paper Products Co.	4.90c
Barton, Duer & Koch Paper Co.	6.00c
R. P. Andrews Paper Co.	5.00c

Estate of Late Harry P. Gould

[FROM OUR REGULAR CORRESPONDENT]

LYONS FALLS, N. Y., November 19, 1938—The will of the late Harry P. Gould, head of the Gould Paper Company, was filed this week with the county surrogate and while the estate is believed to aggregate several millions of dollars the probate petition gives no indication of the amount. The widow and two sons are the sole beneficiaries. Under the codicil Mrs. Gould is to have the income of 4,000 shares of the Gould Paper Company stock as long as she lives or until she remarries. In the event of death or remarriage the 4,000 shares will be divided equally between the two sons, unless one of them shall have died before she does, in which case her interest in the 4,000 shares will go to the surviving son. Another provision is that the income from 5,707 shares of the company stock shall go to Gordon H. P. Gould, the present manager and head of the Gould Paper Company. In case he should die before Henry R. Gould then the income from these shares shall go to the latter. The trust relating to the 13,707 shares will terminate upon the death of the two sons or upon the death or remarriage of the widow and the death of one son. Upon the termination of the trust the principal of it will be paid to Mrs. Gould and the two sons, the proceeds of 4,000 shares going to Mrs. Gould, 5,707 shares to Gordon H. P. Gould and 4,000 shares to Henry R. Gould. The trustees are empowered to vote, manage, hold, sell or otherwise control the paper company shares as their discretion may dictate for the best benefit of the beneficiaries. All stock dividends declared are to be considered a part of the body of the estate and not the income. The late Mr. Gould was one of the wealthiest of Northern New York residents. He succeeded to the estate of his father, Gordias H. P. Gould, whose estate was appraised at $3,325,000 after his death in 1919. At one time Gordias H. P. Gould and Harry P. Gould controlled the St. Regis Paper Company, which they sold to the Carlisle syndicate about 22 years ago. In 1936 Harry P. Gould also owned 130,000 acres of timberlands in the Adirondacks and valuable water powers. The executors of the will are Mrs. Gould and her two sons.

Quebec Reduces Pulpwood Cut

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 21, 1938—According to the Lands and Forests Department of the Province of Quebec between 22,000 and 24,000 woodsmen are engaged in the forests in the cutting of pulpwood and saw wood, as compared with 48,000 last year. When the cut was much greater. Since the beginning of the season 202,000,000 cubic feet of wood has been cut, 80% being pulpwood. The reduced cut is ascribed to over-production a year ago.

The Quebec District showed the greatest reduction in this year's cut, due to the fact that two of the large mills did not establish shanties. Other concerns in this region cut about 6,000,000 cubic feet.

St. Maurice region cut 50,000,000 cubic feet. Lake St. John and Chicoutimi, 20,000,000, Hull and Temiskaming, 25,000,000; Gaspe and Rimouski, 30,000,000; Abitibi, 10,000,000; Montreal, 18,000,000; North Shore, 35,000,000; Riviere du Loup, 5,500,000 and Temiscouata 3,000,000 cubic feet.

New Members of N. P. T. A.

To the already long list previously published of new members of the National Paper Trade Association, should be added: Hollis & Duncan, Inc., Chicago; Levin Bros. Paper Co., Chicago; Fred Rentz Paper Co., Chicago; Rauth Bros., Inc., Chicago; Donaldson Paper Co., Harrisburg; Johnston, Keffer & Trout, Harrisburg.

It is expected an additional list of new members will be released as soon as the usual formalities are completed and when their membership becomes effective. Also it is expected the list of new members will be greatly augmented as a result of "Fin Jamison" Membership Week Drives which are planned for the different association territories on various dates to be announced later. The officers and members of all regional associations are already preparing for intensive drives which are expected to fill the quota for the time being.

Booth Memorial Testimonial

At the meeting of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry, the following resolution was unanimously approved:

"In recognition of the long and untiring services of Levis Miller Booth in the field of water treatment, the Delaware Valley Section wishes to express its sense of personal loss in the death of Mr. Booth, and its appreciation of his services as a member of this section and also as chairman of the newly formed water committee of the association."

Board Men Re-elect Officers

The National Paperboard Association at its annual meeting held recently in New York, re-elected all its officers for the ensuing year as follows: President, Henry D. Schmidt, president of Schmidt & Ault Paper Company, York, Pa.; Vice-president, S. M. Phelan, Jr., West Virginia Pulp and Paper Company; Secretary-treasurer, H. S. Adler; Executive manager, Frederick G. Becker; Secretary of the Eastern Division, D. A. Seeley, and Statistician, Grafton Whiting.

F. P. Lyden to Handle Used Machinery

F. P. Lyden, who was formerly manager of manufacture of International Paper Company, and who for the last several years has been doing consulting work in New York, is opening an office to handle used machinery and scrap metal, accepting used metal as payment for equipment. Mr. Lyden believes that this is the first time that scrap metal has been accepted as payment for equipment and feels that this should act as an inducement towards securing business. Mr. Lyden's office will open for business at 11 West 42nd street, New York, December 1.

R. N. Finlay Opens Agency in New York

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., November 21, 1938—Robert N. Finlay, formerly connected with the American Writing Paper Corporation, George H. Ellis Company and the George W. Wheelwright Paper Company, has established his own business as a paper mill agent in New York City.

Chicago Trade Better Than Expectations

Buying Activity In Sulphite Bond Papers Stimulates Demand In Middle West — Good Demand Reported For Book Papers With Other Grades of Paper Improved—Paper Trade Raising $26,000 Quota — Other News

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 21, 1938—Reports of improved prices in sulphite bond lines and other lines as well have been of assistance in stimulating demand to a point slightly above the seasonal expectations according to local offices. In the sulphite bond market, where the drastic changes of the past few weeks have been noted, there is considerable activity among buyers with price strengthening said to be in the immediate offing. The kraft paper executives concentrated their attention this week on the New York meetings with local executives expressing the hope that something could be done to reconcile the market situation with the comparatively good demand now existing. Book paper representatives were expected in Chicago next week to review the situation in their own field where demand has been reported as good but with the profit margin very, very narrow. Board prices were firm and the market fairly acceptable. Groundwoods and newsprints were little changed although stimulated by regular seasonal demands. Waste papers were little changed. All in all, a more optimistic note was registered than has been in evidence for some time past.

Paper Trade Raising $26,000 Quota

The Chicago paper industry is giving a great deal of time and effort to raise a total of $26,000 as its share of the $3,550,000 being amassed by Chicago's Community Chest Fund for the purpose of financing emergencies not covered by present relief units. Since October 17 and up to the evening of November 15 the army of paper executives had amassed $10,000 or approximately 40 per cent of the amount they must have on the boards before the drive is concluded.

Heading the paper industry in this work is the Industrial Chairman of the Paper Group, L. S. Altholz of Inlander-Steindler Paper Company. Richard S. Bull of Bradner, Smith & Company, is serving as chairman of the Advisory Committee for the paper industry. Included among the vice chairmen are A. G. Ballenberg, Morris Paper Mills, folding box group; J. T. Burrus, Salesmens Association of the Paper Industry, coarse paper manufacturers; George K. Gibson, Mosinee Paper Mills; W. E. Beier, Beier and Company; R. W. Darnell, W. C. Ritchie and Company; A. G. Fegert; W. W. Goldberg, Bateson and Company; Courtney Reeves, Allied Paper Mills; A. G. Shannon, International Tag and Salesbook Company; R. P. Snyder, Transo Envelope Company; J. B. Ughetti, Dwight Brothers Paper Company and T. F. Woody, Pioneer Paper Stock Company.

The industry is also well fortified with team captains including the following who deserve recognition for the job they are doing: W. A. Jones, Riverside Paper Corporation; Robert Levinson, Eagle Wrapping Products Co., R. B. Little, Swigart Paper Company; M. C. McNulty, McNulty Paper & Twine Company, G. A. Mueller, Zellerbach Paper Company; D. F. Peck, Hanchett Paper Company; A. B. Ripley, Atlas Box Company; Walter Schulman, Levin Brothers Paper Co., William Shapland, Fred Rentz Paper Company; W. L. Shea, Bradner, Smith & Company; W. J. Tilden, Mead Sales Corporation; J. C. Allen, J. W. Butler Paper Company and H. B. Berger, Appleton Coated Paper Company.

Also on the list of team captains are Henry W. Borchardt, Pilcher Hamilton Paper Company; A. L. Brown, Nekoosa-Edwards Paper Company; William Chukerman, J. Chukerman & Sons; George Crafts, Eastern Manufacturing Company; J. R. Diggs, Mosinee Paper Mills; L. A. Ellis, Northwest Paper Company; H. C. Engel, Central Paper Company; Mortimer Inlander, Inlander Bros.; B. A. Weathers, Union Bag & Paper Corporation; S. Weil, Joseph Weil and Sons, Inc., and James G. White of the James White Paper Company.

Book Group Meets at Drake Hotel

The Book Paper Association will hold an important meeting at the Drake Hotel in Chicago Tuesday and Wednesday, November 22 and 23 according to information received from Secretary Kennety who recently accepted the job of handling the affairs of the association.

Chicago-made Digesters in Operation at St. Joe

It is reported that a number of Chicago made items are in the new Florida mills of the St. Joe Paper Company which have recently gone into production. Included are four 4300 cubic feet digesters made by the Chicago Bridge & Iron Works.

Equipment Companies Issue New Booklets

The Elgin Softener Corporation of nearby Elgin, Illinois, has recently issued a bulletin, Number 510, giving an informative account of continuous blowdown systems for steam boiler plants. The bulletin also provides typical plant studies, charts and easily understandable tables for prospective buyers in the paper industry.

The Askania Regulator Company of Chicago has recently sent out to the industry a new brochure discussing, Automatic Control for Steam Generating Units. The interesting piece of direct mail includes applications of boiler controls and provides a full discussion of the fundamental problems of boiler control along with a presentation of the Askania jet-line principle which is well illustrated.

Another important supplier to the paper trade, the Chicago Belting Company, has recently perfected a new brand mark, a between-the-ply brandmark which is printed on the inside of each belt. The mark is reported to be permanent from a duration standpoint and not only provides the name of the firm but also the month and year of manufacture as an instanteous record of the age of the product itself.

News of the Wisconsin Paper Industry

Kimberly-Clark's Lakeview Mill On Six-Day Week Schedule — Sidney Wells To Join Staff of Paper Institute—Joseph Conway of Hoberg Paper Mills Reelected Head of the Manufacturers' Association—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 21, 1938—All departments of the Kimberly-Clark Corporation's Lakeview mill at Neenah, Wis. have been restored to operating schedules of six days per week, according to announcement of S. F. Shattuck, vice-president, resulting in increased wages for approximately 500 workers out of the total of 1,000 employed at the mill. Increased sales of Kleenex and Kotex throughout the country caused the stepping up of production schedules to practically a normal basis, after curtailment several months ago when warehouses were overstocked.

The Lakeview converting department have been operating six days a week since early in August. The paper manufacturing department went back on a six-day schedule early in September. Production facilities have been expanded during the last year and all of this equipment is in use in the present operating schedules.

Sidney Wells To Join Institute's Staff

Sidney D. Wells, member of the consulting firm of Paulson and Wells, Appleton, Wis., for the last three years, will join the staff of the Institute of Paper Chemistry at Appleton December 1 as a research associate and instructor in pulp and paper technology, according to announcement by Westbrook Steele, executive director.

Mr. Wells has had an outstanding career in the research field and in the paper industry. He was graduated from the Massachusetts Institute of Technology in 1907 and served as assistant chemist for the Central Aguirre Company of Puerto Rico in 1908, and as chemical engineer for the Mead Pulp and Paper Company in 1909-10. He then accepted appointment as engineer in the United States Forest Products Laboratory at Madison, Wis., where he remained until 1925 with the exception of one year as assistant superintendent and chemist for the Chesapeake Pulp and Paper Company. During his term with the Laboratory, he collaborated with John D. Rue in preparing a bulletin for the United States Department of Agriculture covering a summary of pulping and grinding characteristics of a large variety of American woods. He also published a number of papers on pulping of southern woods, and assisted in studies on the value of flax, straw and cotton linters as papermaking materials. He was interested in the development of the semi chemical pulping process, and was intimately connected with the application of the rod mill to pulping and bleaching operations. He began his work on boards, studying, among other materials, the suitability of oat hulls and straw.

In 1925, Mr. Wells left the Laboratory to become director of the Paper Mill Laboratories, Inc., Quincy, Ill., where he remained until 1930. During that period he developed an odorless egg-case filler board. He was technical director of the Nekoosa-Edwards Paper Company from 1930 to 1932, and technical adviser for the Combined Locks Paper Company from 1932 to 1935. At Nekoosa-Edwards he developed multi-bleaching for kraft pulp, and at Combined Locks perfected a method of deinking groundwood papers, particularly old telephone directories.

Mr. Wells is a member of the American Institute of Chemical Engineers, the Society of American Foresters, the Technical Association of the Pulp and Paper Industry, the American Pulp and Paper Association, the American Pulp and Paper Mill Superintendents Association, and the American Association for the Advancement of Science. He is also a member of Alpha Chi Sigma and Sigma XI.

Joseph Conway Heads Manufacturers' Assn.

Joseph M. Conway, president and general manager of Hoberg Paper Mills, Inc., Green Bay, Wis., was reelected president of the Wisconsin Manufacturers Association at its annual convention Thursday and Friday of last week at Hotel Pfister, Milwaukee, Wis. Wisconsin paper mill executives were numerous among the industrialists attending. Mr. Conway has been president during the last year, and presided at the sessions.

One of the principal speakers was William F. Ashe, director of the newly created Wisconsin Department of Commerce and formerly personnel director of the Thilmany Pulp and Paper Company, Kaukauna, Wis. His department has recently prepared an indexed list of Wisconsin manufacturing concerns which shows there are now 92 manufacturers of paper and paper products in the state.

Mr. Ashe described the new department as an agency through which business and industry might get their views before the states. Surveys are being made to ascertain what industries are declining and which ones are prospering. Efforts are being made to simplify reports business is required to make to governmental agencies and to eliminate as much duplication of these reports as possible. The tax picture as far as industry is concerned also is being studied.

$10,000 Fire at So. Kraft's Converting Plant

Southern Kraft Corporation, Marinette, Wis., had fire and water damage believed to be upwards of $10,000 in a blaze at its converting plant early Saturday morning, November 12. Spontaneous combustion was believed to have been the cause.

The fire started in a storage room where facial tissues and unconverted tissue stock were piled, and was discovered by the night watchman. It was confined to a small area by firemen, but the heat opened 15 sprinkler heads, causing water to seep through the floors to the basement, and damaging other stock. Some of the motors were temporarily damaged by water, but the machinery and building had practically no damage.

The mill was able to resume its usual schedules the following Monday.

Government Insists on Proration Agreement

Ontario Government's Demand That Great Lakes Paper Co. Adhere To Proration Agreement Due To Contemplated Contract of 20,000 Tons of Newsprint—Pulpwood Cutting In Algonquin Park—Other Trade News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 21, 1938—The recent action of the Ontario government in demanding that the Great Lakes Paper Company, Limited, Fort William, Ont., adhere to the proration agreement was due, it is understood, to the fact that the company was about to take a Milwaukee contract amounting to 20,000 tons annually, now held by the Minnesota and Ontario Power Company. The business was to be taken on the basis that the contract would rank *pari passu* with the other newsprint contracts held by the company. It was the new contract, it is stated, which brought the matter to a head. Formerly operations of the company while in excess of the average for the industry had not been interfered with. The volume of tonnage that must be surrendered by the Great Lakes Paper Company is not revealed yet and will have to be worked out within the industry. It is indicated that the change will have a detrimental effect on earnings, especially when the industry as a whole is operating on a relatively low scale.

Great Lakes Paper Company has arrears of dividends on its shares and the balance of deferred bond interest to meet on July 1, 1939. Last year the company was able to earn its bond interest by a wide margin and figures for the first half of 1938 indicate that a substantial profit would be shown for the year after providing for bond interest.

Details of Agreement Not Yet Decided

According to Hon. Peter Heenan, Minister of Lands and Forests for Ontario, the company has agreed to prorate production on the same basis as the rest of the newsprint industry. There remain some details to be worked out, largely to provide that too great hardship is not to be imposed on the company, but in principle the Great Lakes Company has accepted the demands of the province. As intimated, C. H. Carlisle, President of the company, offered his resignation to the directors but it is understood that no action has as yet been taken on it. E. G. Long, K. C., of Toronto, is vice president and might likely succeed Mr. Carlisle. No statement is available from Mr. Carlisle regarding the reasons for his resignation. As negotiations are still going on there may be a possibility of him continuing in office.

It is understood that there will not be any changes made in the present timber limits held by the Great Lakes Paper Company. Mr. Heenan said that any company refusing to comply with the prorating agreement was liable to a penalty of one thousand dollars a day for each day of default. The timber cutting rights could be cancelled or the stumpage dues raised. Under the prorating plans companies getting orders which would keep them operating above the average for the industry agree to turn over some of their orders to companies operating below the average or else make a cash payment on a pooling basis. During the past ten months the Great Lakes Paper Company operated at an average of 62 per cent of rated capacity of over 112,000 tons per day.

Pulpwood Cutting in Algonquin Park

It has been alleged that there was wholesale cutting of pulpwood and logs in Algonquin Provincial Park which consists of 2,750 square mills. Walter C. Cain, Deputy Minister of Lands and Forests for Ontario, says there are only nine companies and, not twenty-seven as reported, cutting in the park. In ninety per cent of the area under license, the cutting rights antedated the establishment of the park in 1893 and, in all cases, departmental regulations are being rigidly imposed. Cutting of matured timber is essential. On the matter of slash Mr. Cain said that licenses, old and new, specifically provide that their holders are subject to the Forest Fire Prevention Act and may be required by the department to make such disposition of their slash as the department considers advisable. The closest check on fire hazards is maintained and not since 1924 had there been any fire of serious proportions in the great park.

Provincial Paper Opens Extra Log Camps

A. G. Pounsford, manager of Provincial Paper, Limited, Port Arthur, Ont., states the company have opened an additional camp to bring this winter's cut of wood up to normal cordage. He intimated this decision indicated the faith of the company that a normal business year was in prospect for the lines manufactured which are hanging, catalogues, book, rotagravure and half tone. Provincial Paper have purchased fourteen thousand cords of pulpwood from the settlers in the Thunder Bay district entering into two hundred individual contracts.

Lake Sulphite Co. Files Plan for Log Storage

G. S. Currie, receiver for the Lake Sulphite Pulp Company, Limited, Red Rock, Ont., has filed with the Minister of Public Works at Ottawa plans for a booming and holding ground and log storage area to be built in Nipigon Bay, Lake Superior.

Gummed Paper Add To Plant

Gummed Papers, Limited, of Brampton, Ont., have awarded a contract for a one story addition to their plant to make way for increased expansion of their product; Acme Paper Box Co., Limited, 152 Wellington St. West, Toronto, are erecting a brick extension.

Make Wrapping from Grass Pulp

WASHINGTON, D. C., November 23, 1938—Wrapping paper is now being made in India for the first time by the Forest Research Institute, Dehra Dun, from a mixture of mechanical pulp from wood and chemical pulp from grass, according to a recent report from the office of the American Trade Commissioner, Calcutta.

Financial News of Pulp and Paper Industry

A. P. W. Stockholders Approve Plan To Ask That Interest On Bonds Be Relinquished — Scott Paper Co. Nets $1,107,532 — National Container Corp. Reports Net Profit of $101,321 — American Writing Shows Loss.

NEW YORK STOCK EXCHANGE

High, Low and Last for the Week Ending November 23, 1938

	High	Low	Last
A. P. W.	3½	3¼	3¼
Armstrong Cork Co.	52¾	50	51
Celotex Corp.	14⅞	13¾	14
Celotex Corp., pf.	67	66	66
Certain-Teed Products Corp.	10⅞	10	10¾
Certain-Teed Products Corp., pf.	42½	39	39¾
Champion Paper & Fibre Co.	30¾	29	30
Champion Paper & Fibre Co., pf.	99½	97¼	99½
Congoluem-Nairn Co.	26¾	25½	26½
Container Corp. of America	16¾	15¼	15½
Continental-Diamond Fibre Co.	10⅝	9¼	9⅜
Crown-Zellerbach Co.	13⅞	13⅛	13¼
Crown-Zellerbach Co., pf.	91⅝	89	89⅜
Flintkote Co.	27½	25⅜	25⅞
Robert Gair	4¼	4	4
Robert Gair, pf.	13	11	11
International Paper & Power	13¾	12⅜	12¾
International Paper & Power, pf.	48½	45⅛	46
Johns-Manville Corp.	103¼	99	101⅛
Johns-Manville Corp., pf.	128	127	127
Kimberly-Clark Corp.	27½	27½	27½
MacAndrews & Forbes	29⅛	29	29⅛
MacAndrews & Forbes, pf.	121	121	121
Masonite Corp.	57	55¾	55¾
Mead Corp.	13¾	12¾	13
Paraffine Companies, Inc.	58¾	58	58
Paraffine Companies, Inc., pf.	99⅝	99⅝	99⅝
Ruberoid Co.	30½	28¾	28¾
Scott Paper Co.	50⅛	49	50
Sutherland Paper Co.	30½	29¾	29¾
Union Bag & Paper Corp.	13¼	12⅜	12⅝
United Paperboard Co.	7½	7⅛	7½
U. S. Gypsum Co.	108½	101	103¼

NEW YORK CURB EXCHANGE

High, Low and Last for the Week Ending November 23, 1938

	High	Low	Last
American Box Board Co.	11	10	10
Brown Co., pf.	20	20	20
Great Northern Paper	39¼	38½	38¾
St. Regis Paper Co.	3¾	3⅛	3⅛
St. Regis Paper Co., pf.	60	60	60
Taggart Corp.	5⅞	5	5

A. P. W. Approves Interest Cut

ALBANY, N. Y., November 21, 1938—Common stockholders of A. P. W. Paper Company at an adjourned meeting approved the plan whereby holders of the first mortgage bonds would be asked to defer or relinquish part of their fixed interest not to exceed 3 per cent, for the remaining life of the bonds. The plan provides that the company use the interest so relinquished for the purchase of new machinery or equipment or improvements to existing machinery and equipment or for fixed plant improvements, which new machinery, plant or equipment shall be placed under the existing lien of the first mortgage and deed of trust.

Under the plan, the holders of 25-year 6 per cent convertible notes of 1955 would be asked to agree that their notes should be made non-cumulative income notes for the remaining life of the notes, in consideration of the reduction in the price per share at which conversion of such assenting notes into common stock of the company may be fixed. The original conversion privilege entitled the holders to 80 shares of stock per $1,000 note. The plan provides that assenting holders shall be entitled to a rate of conversion which at no time shall be greater than 160 shares of common stock for each $1,000 principal amount of notes.

The recent decision of the company to investigate the advisability of moving the company's plant to the South has created considerable interest on the part of Chambers of Commerce and other responsible parties in Georgia, Louisiana, Mississippi, South Carolina, Texas, Virginia, Alabama, Arkansas, and Florida. The company proposes to make a thorough investigation of this matter. D. G. W. Hollister, president of the company, said that he had been greatly impressed by the many advantages which had been brought to the company's attention in the way of free plant sites, tax exemption for a considerable period of years, attractive power rates, low construction, raw material and labor costs.

Scott Paper Co. Nets $1,107,532

The Scott Paper Company, Chester, Pa., reports for the nine months ending October 2, 1938, net earnings of $1,107,532 or $1.92 a share on the 576,538 common shares outstanding as at the close of this period. This compares with net earnings of $965,233 for the nine month period of 1937, or $1.67 a share calculated on the number of shares now outstanding.

In the third quarter of 1938 net earnings were $363,905 as compared with $351,408 in the same quarter of 1937. Net earnings for the second quarter of this year were $387,213 and for the first quarter of 1938 were $356,414.

Net sales for the nine months were $12,145,000, compared to $10,409,000 in the same months of 1937.

The company now has in progress a $2,500,000 plant expansion program, including the installation of a new paper making machine of greater estimated capacity than any of its present machines. It is expected that the new production unit will be completed shortly after the first of the year.

The board of directors of the Scott Paper Company, Chester, Pa., declared a quarterly dividend of forty cents per share and an extra dividend of twenty cents per share on the outstanding no par value common capital stock of the corporation, payable December 15, 1938 to shareholders of record December 2, 1938.

National Container Makes Good Report

National Container Corporation reports for nine months ended September 30, 1938, including its share of subsidiaries' profits, net profit of $101,321 after taxes, interest, amortization, etc., equal to 30 cents a share on 330,482 shares of capital stock outstanding.

This compares with $361,898 (revised) equal to $1.09 a share for nine months ended September 30, 1937.

For quarter ended September 30, 1938, net profit was $47,021 equal to 14 cents a share.

Current assets as of September 30, last, were $1,029,952 against current liabilities of $345,065.

"The kraft paperboard mill in Jacksonville, Fla., commenced operations in May, production being gradually stepped up to designed capacity of 200 tons daily by September, where it is being maintained," Samuel Kipnis, president of National Container Corp. says. "Requirements of the company and its subsidiaries equal or exceed the mill output. The company placed in operation last month a new container manufacturing unit constructed on property at the Jacksonville mill. Substantial new business is anticipated from the Southern market."

Dexter Sulphite Pulp & Paper Wins Suit

DEXTER, N. Y., November 19, 1938—In a decision handed down this week by Supreme Court Judge Crouse the Dexter Sulphite, Pulp and Paper Company is the victor in the suit brought by Mrs. F. E. Campbell and Mrs. A. M. Campbell to compel delivery to them of the stock holdings of their deceased husbands, a turnover of company control to them and an accounting by the trustees of alleged profits of the concern. In his decision Judge Crouse contends that the plaintiffs are not the owners of all, but only of one-half of the shares of the company bid in on the two estates sales and that the voting trust agreement of April, 1937, is valid, the substance of the same having been explained to the plaintiffs and agreed to by them. He is of the opinion, however, that under the terms of the voting trust agreement, trust certificates in the form therein set forth should be issued to each of the plaintiffs for the shares belonging to them and held by the trustees.

Dryden Operating Profit $200,064

TORONTO, Ont., November 21, 1938—The Dryden Paper Company, Limited, Dryden, Ont., of which J. H. A. Acer is president, producing kraft sheathing paper and kraft and manila wrapping paper, for the fiscal year ending September 30, had an operating profit of $200,064 as compared with $288,035 in the preceding year and $175,308 two years ago. The current assets of the company stand at $508,840 and exceed current liabilities by some $450,000. Net earnings before depreciation and interest were $98,396 compared with $188,838 a year ago.

American Writing Shows Loss

HOLYOKE, Mass., November 21, 1938—The first 9-month period of 1938 showed a loss of $139,917 for the American Writing Paper Corporation according to a financial statement made available to stockholders last week. The total income of the concern during that period was $4,252,389 and expenses are listed as follows: materials, fuel, transportation, supplies and other costs, $2,900,106; equipment, $153,578; interest and rent, $9,723; taxes, $131,302; employes salaries and wages, $1,167,596; services of management, $30,000.

Northern Paper Co. Incorporates

Incorporation of the Northern Paper Company, Limited, was announced recently from Victoria, B. C. This firm will carry on business as dealers in pulp and paper products according to their registration papers and have capitalization of $10,000. Registered offices are located at 102-06 Pacific building, 744 West Hastings street, Vancouver, B. C.

Obituary

Carl Schwalbe

Prof. Carl Schwalbe recently died in Homburg, Germany, at the age of 67. Dr. Schwalbe was an outstanding contributor to the knowledge of cellulose chemistry. In 1911 his most important publication appeared under the title "Die Chemie der Cellulose" which was a standard work that summarized for the first time the entire field of cellulose chemistry. This book was recently completely revised but death intervened before it came from the press. Dr. Schwalbe developed the copper number method of pulp quality determination. When he died he was Director of the new Wood Research Institute in the Forestry Hochschule at Eberswalde, Germany. Dr. Schwalbe is the father of H. C. Schwalbe of the Mead Corporation, Chillicothe, Ohio.

Charles F. Brown

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 21, 1938—Charles F. Brown, 93 years old, one of the two remaining Civil War veterans of Appleton, Wis., died last week. He was one of the earliest paper makers in the city, having settled in Appleton in 1852 when he was seven years old. He was employed at the former Richmond Paper Mill, one of the first to be established in the Fox River Valley. It was located on the site of the present Interlake Pulp and Paper Company division of the Consolidated Water Power and Paper Company at Appleton.

Henry J. Doane

[FROM OUR REGULAR CORRESPONDENT]

MECHANIC FALLS, Me., November 21, 1938 — Henry J. Doane, 53, an official of the Waterfalls Paper Mills from 1906, who had retired two years ago, died at his home Saturday after a long illness.

He was born at Albany, N. Y., October 30, 1885, the son of Charles and Nellie Mason Doane. His widow, Blanche Doane; a son, H. Justin Doane, and his mother are living.

John Malcolm Hart

John Malcolm Hart, president of the John M. Hart Company, Inc., Graybar building, New York, manager of sales for the Keyes Fibre Company, died on November 19.

Bulletin Describes Wide Use of AMSCO

A new bulletin isued by the American Manganese Steel Division of the American Brake Shoe and Foundry Company, Chicago Heights, Ill., entitled "AMSCO Alloy Heat and Corrosion Resistant Castings for Industrial Applications" has 24 profusely illustrated pages packed with interesting information concerning the many uses for AMSCO Alloy, the production facilities and research activities of its maker and the composition of the six standard grades of AMSCO Alloy, together with its physical properties.

Plant men in those industries using castings exposed to heat, corrosion and abrasion will want a copy of this informative publication.

Boston Paper Trade Association Meets

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 21, 1938—One of the most interesting gatherings of the Boston Paper Trade Associations ever held was the fall meeting at the Exchange Club Wednesday evening, with 115 members and guests present. Owing to the passing of President Walter J. Raybold a few months ago, and the absence of First Vice-President John L. Hobson, Second Vice-President Robert M. Stone presided.

New Members Elected

After the dinner there was a brief business meeting, at which the following were elected members of the Association: Henry Curtis, Curtis 1000, Inc., Hartford, Conn.; Russell S. Madden, American Writing Paper Corporation, Holyoke, Mass.; Floyd H. Blackman, D. F. Munroe Company, Boston; John C. Hurd, Knight, Allen & Clark, Inc., Boston; Sheldon C. Collins, Rising Paper Company, Housatonic, Mass.; Ralph Beckwith, Crocker, Burbank & Company Association, Fitchburg, Mass., and Leo Gratton, White Washburn Company, Hinsdale, N. H.

Tribute To Late W. J. Raybold

Mr. Stone paid a tribute to the memory of Mr. Raybold, noting that flowers were sent and a personal letter to Mrs. Raybold.

Norman Harrower spoke in a similar vein, saying that what Mr. Raybold prized above all were his friends and the presidency of the Boston Paper Trade Association.

F. Bendel Tracy said he prized the friendship of Mr. Raybold, who was always ready and willing to do whatever he could in connection with the Boston Paper Trade Association. The testimony to his memory at Pittsfield was one long to be remembered, he said.

Mr. Stone presented the compliments of First Vice-President John L. Hobson, who had undergone an operation, but was doing well.

Commander D. B. MacMillan Speaks

He then introduced Commander Donald B. MacMillan who mentioned in connection with trees and paper pulp the trees in the Far North one and a half inches high. Commander MacMillan said that he was born at the tip end of Cape Cod.

Speaking on "Finding Records in the Far North," he noted the work of other explorers, and pulling from underneath a rock a bullet and Dr. Kane's cap which the doctor had placed there. He spoke of the Duke of Abbruzzi, Peary and Amundsen. He brought back with him Amundsen's records.

Commander MacMillan, who has just returned from his seventeenth Arctic expedition and is to go on another one, showed a large number of extremely interesting slides and moving pictures taken in the Arctic regions and on the return to Christmas Cave and Wiscasset, Me. Some of the pictures were in natural colors. The pictures included birds, of which there are many kinds in the Arctic regions, Eskimo children eating raw birds and eggs, dogs and hunting the musk ox. Commander MacMillan quoted conversations in the Eskimo language, flashing on the screen a type-written paragraph in that tongue, containing a word of 74 letters. He is preparing a book on the language, containing the meanings of 7,000 words. He has taught various subjects, including Greek and Latin for five years in high school.

Those In Attendance

Those present included Henry Curtis, Henry M. Donahue, Chas. Charnella, John G. Clark, Robert S. Ellcott, John R. Whitney, Ray Wigert, J. R. Cryan, E. L. Wood, W. N. Stetson, Jr., Hubert W. Lockhart, John H. Calligan, Charles A. Shaw, Haritry A. Hurburt, "Ted" Clifford H. Harris, E. T. Simpson, J. H. Masselink, Bill Collins, C. J. Brown, Carl J. Knutsen, Lennox Ransom, Walter G. Butler, Lee H. Hulett, R. H. Morrell, Edward H. Little, Clifton T. Hall, Frank B. Cummings, Arthur M. Burr, Willard H. Loud, C. Frederic Wellington, C. W. Harvey, W. W. Newton, K. H. Ways, R. C. Chase, R. O'Neill, D. Cheever, Bruce Crane, H. J. McLellan, W. Ross, H. C. Fowler, Sheldon C. Collins, S. E. Maglathlin, F. E. May, J. W. Vivian, W. E. Porter, Jr., Norman Kimball, Chas. W. Fields, S. W. Bartlett, John E. A. Hussey, R M. Beckwith, Irving N. Esleeck, H. T. Bigelow, Charles T. Dole, Charles S. Proctor, O. T. Bracken, H. L. Carter, Paul M. Beach, Walter P. Simonds, Harry R. Woodward, Herbert A. Lindenberg, Earl S. Clark, J. J. O'Brien, John C. Ross, W. Gardner Very, H. C. Thayer, Harold A. Allen, J. Roach, John Kelley, C. W. Beals, Jesse G. Skift, C. H. Dodge, H. A. Wingate, Herbert W. Robbins, Gilbert T. Singleton, Howard E. Chase, A. W. Middleton, Nathan S. Clark, Jack Hunel, Jack Mathers, V. R. Ham, Joseph J. Lewis, John P. Megaller, Paul B. Fraser, Russell S. Madden, F .G. Lockwood, H. J. Norton, R. D. A. Ewing, R. L. Day, L. L. Claflin, C. H. Waite, J. J. Dinzer, E. P. Hay, Warren Young, F. H. Blackman, E. P. Clausmeyer, J. J. Halloran, H. J. Bourgne, Al. Carter, Fred Herbolzheimer, Al. Sandberg, T. W. Dixon, Ted Lyman, R. P. Robinson, Stafford King, Edward M. Graham, C. W. Nelson, L. L. Brigham, C. W. Townsend, E. Sussenguth, John C. Hurd, N. Harrower, R. M. Stone, D. B. MacMillan, F. B. Tracy, Jack Brewer and T. C. Casey.

Officers for 1938-39

The officers for 1938-1939 are: First vice-president, John L. Hobson; second vice-president, R. M. Stone; treasurer, T. Charles Casey; secretary, J. H. Brewer.

Chillicothe's Outstanding Citizen

CHILLICOTHE, Ohio, November 21, 1938—Edwin F. Bearce, vice president of the Chillicothe Paper Company, was recently chosen Chillicothe's outstanding citizen for 1938.

Mr. Bearce's selection for that honor by a secret committee of the Junior Chamber of Commerce was announced at a dinner at the Warner hotel, with Raymond F. Fletcher, business manager of the Portsmouth Times, the chief speaker.

A metal plaque was given Mr. Bearce for his civic contributions as chairman of the city's planning commission, chairman of the budget committee of the Council of Social Agencies and his activity in conservation, flood control and boy scout affairs.

Pacific TAPPI Discussed Foreign Laboratories

The Pacific Section of the Technical Association of the Pulp and Paper Industry met at the Monte Cristo Hotel, Everett, Wash., November 10, 1938.

C. F. Rosenblad, inventor of the Rosenblad heat recovery system for sulphite and sulphate mills, spoke briefly on heat recovery problems and described the spiral heat interchanger which is part of his system for the recovery of heat from the blowing of digesters in both the sulphite and sulphate process.

H. K. Benson, professor of Chemical Engineering at the University of Washington, discussed pulp and paper laboratories of Europe which he visited during the past summer. Dr. Benson travelled to Europe as a delegate from the United States to the International Union of Chemistry which met at Rome, Italy, in May. He spent considerable time in Germany and Scandinavia as well as Italy and visited the various research laboratories which were working on cellulose chemistry. He talked on the work the various institutions were doing and something of their personnel and organizations. The principal laboratories which he described were the French School of Paper Making in Grenoble; the Royal Experimental Station of the Industry of Pulp and Vegetable Fibers at Milan, Italy; the University of Heidelberg where Dr. Freudenberg is carrying on some very important work on the structure of lignin; the Institute of Cellulose Chemistry at Darmstadt; the Prussian Wood Research Institute of Eberswalde; the Central Laboratory of Finnish Industries: the Institute for Cellulose Research of the Royal Technical University of Sweden, and the Paper Industry Research Institute of Oslo, Norway. Dr. Benson showed slides of the laboratory buildings and equipment and of particular interest was the discussion of the work being done in the development of textiles from staple fibres.

Mr. Lewis Hebbs of Cross & Bevan, London, commented informally on Dr. Benson's talk and made some interesting comments on methods of pulp testing and the use of various hydrating units in the laboratory, such as the Lampen mill and Valley beater. An interesting discussion followed the regular scheduled talks.

N. W. Coster, Chairman of Pacific TAPPI, was unable to be present and Vice Chairman, W. T. Webster, of the St. Regis Kraft Corporation, presided.

Among those present were: Jerry Alcorn, Niles M. Anderson, G. J. Armbruster, Chas. M. Barr, H. W. Beecher, Dr. H. K. Benson, L. K. Bickell, G. H. Brazeau, Ben T. Briggs, James Brinkley, John E. Brown, Robt. E. Brown, Eugene Browning, A. M. Cadigan, R. D. Campbell, John M. Carlson, R. F. Chase, A. Cristensen, P. W. Christensen, Dick H. Cook, Sidney M. Collier, J. V. B. Cox, Emil Creutz, R. B. Currie, James D. L. Drake, A. E. Duke, E. Ekholm, E. O. Ericsson, L. P. Fortier, O. E. Fox, J. D. Fraser, Harold T. Fretz, Irving R. Gard, A. S. Gerry, Wm. R. Gibson, Harold G. Griep, Don Grant, W. C. Grieve, H. M. Gustafson, A. M. Shanahan, John G. Hardy, L. Hebbs, L. E. Hill, Jr., George W. Houk, R. M. Inkster, E. R. Johnson, W. A. Kelly, W. W. King, M. E. Kinsey, John Kjome, K. A. Knudson, Jack Martin, J. H. McCarthy, G. H. McGregor, Donald P. McPhee, K. M. Milligan, T. E. Moffitt, Walter Morris, C. T. Mulledy, Joseph J. Murphy, Fred Nicholson, C. B. Niel, Adolf Orup, Fred. M. Pape, A. N. Parrett, J. W. Peckham, Russell M. Pickens, Paul Pittenger, Albert S. Quinn, Carl A. Ramstad, H. Rehnberg, Ed. F. Riely, Carl Ries, Oliver E. Ronken, Curt Rosenblad, James Ruck, H. Radford Russell, H. Solbakken, S. A. Salmonson, Paul Schlosser, Geo. E. Schmidt, J. M. Shedd, Brian Shera, H. N. Simpson, Stanley E. Sorenson, H. T. Stoddard, Philip E. Sullivan, H. V. Tartar, Earl G. Thompson, Edw. A. Vohs, H. F. Warren, Robert Watt, Wm. T. Webster, Louis A. Wendt, Jack Wilcox, H. F. Winklesky, and R. E. B. Wood.

N. E. TAPPI Discusses New Processes

The New England Section of the Technical Association of the Pulp and Paper Industry held its first regular meeting at the Roger Smith Hotel, Holyoke, Mass., Friday evening, November 18th, 1938. R. G. Macdonald, Secretary of TAPPI, presided as Chairman in the absence of John B. Calkin, who was unable to attend. There were about seventy present, many being unable to drive to Holyoke because of the heavy prevailing fog.

The first speaker was Fred A. Weymouth, of the Products Development Laboratory, International Printing Ink Company, Chicago, Ill., who talked on the relation of paper and ink to the modern trends in printing. In this talk Mr. Weymouth described in detail the research procedure employed in developing inks that could be dried by passing printed sheets through a heated tunnel at high speed. Such magazines as Life, McCall's, Colliers, New Yorker and Esquire are now being printed by this process. Mr. Weymouth's paper will be published in full at an early date.

The second speaker was Ernst A. Hauser, of the Massachusetts Institute of Technology, who, for the first time before a large group, presented the story of "Alsifilm" and the new sheet made of Bentonite clay. The product has the appearance of glassine or cellophane although cellulose fiber or other materials can be added to change the nature of the sheet. Its uses appear to be as wide as that of paper and is particularly useful for wrapping and insulating purposes. It can be used for printing and writing and is odorless, tasteless, resistant to fire and acids. Because of its aluminum and silicon content it has been named "Alsifilm".

Among those present were: Chas. Backus, F. K. Becker, F. W. Mehrend, W. J. Burke, E. L. Connolly, Frank W. Durgin, C. O. Duston, W. L. Egy, L. G. Epstein, F. J. Flaherty, A. F. Gilmore, T. W. Griffin, Ernie Guen, E. G. Ham, Ernst A. Hauser, W. F. Higbee, A. Hobday, C. A. Homan, H. M. Keating, Paul Knight, Frank Lassiter, John T. Leecock, R. G. Macdonald, Robt. Mannheim, Francis A. Massey, W. P. Morris, F. R. Newton, Chas. O'Neil, W. A. Nivling, C. L. Reece, William Whiting, A. P. Jackson, John Ramsbottom, E. C. Reid, R. W. Pattison, E. H. Penniman, Helen U. Kiely, Lena E. Kelley, H. A. Otto, O. L. Perry, A. C. Redmond, H. W. Richter, M. M. Rubin, L. N. Smith, Thomas L. Stirling, Kurt Wandel, D. S. Wegg, Fred A. Weymouth, and Mr. and Mrs. W. R. Willetts.

Delaware TAPPI Discusses Paper Conditioning

The Delaware Valley Section of the Technical Association of the Pulp and Paper Industry met at the Philadelphia Engineers Club on November 18th, with printers as their guests and C. M. Connor, chairman, presiding. Chairman Connor read an invitation from D. G. Moon, general director, to attend the Southern Paper Festival. Vincent Waters, Technical Assistant to the Secretary of TAPPI, was then introduced.

E. J. Albert presented a brief eulogy in memory of the late L. M. Booth, of Elizabeth, N. J., who, for many years, had been a strong supporter of the work of the Association.

Mr. Connor introduced M. S. Kantrowitz, technical director, Government Printing Office, Washington, D. C., who delivered an address entitled, "Standardization of Relative Humidity for the Conditioning and Testing of Papers". He mentioned that the government and many other consumers and manufacturers are using 50 per cent relative humidity as standard.

The discussion of the subject, led by C. M. Connor, Valley Forge Laboratories; J. d'A. Clark, Scott Paper Company, Miss R. M. Cobb, Lowe Paper Company; R. M. Bates, Thos. M. Royal Company and J. F. Halladay, Container Corporation of America, showed many of those present appeared to favor 50 per cent relative humidity as a standard condition.

Printers, ink makers, converters and paper manufacturers entered into the discussion with so much enthusiasm and logical reasoning that it is apparent that Mr. Kantrowitz's subject is of great importance to the industry as a whole. Mr. Kantrowitz mentioned that the Technical Association is preparing a questionnaire about testing of paper and expressed the hope that all those who receive them will complete them as promptly and accurately as possible.

Over 70 members, printers and other guests were present, and among these were: Miss R. M. Karapetoff-Cobb and Prof. V. Karapetoff, Ridgefield, N. J.; G. L. Schwartz, Joseph Plumstead, Alex Innes, Jr., and J. C. Dieffenderfer, Wilmington, Del.; B. M. Thomas, J. F. Halladay, James C. Shaw, R. W. K. Ulm, B. R. Havens, Sam Reynolds and M. Craig Maxwell, Manayunk, Pa.; Vincent F. Waters, P. M. Loddengaard, P. F. Wehmer, R. T. Bingham, J. J. Lafferty, E. I. Stokes, and R. H. Dillinger, New York City; M. S. Kantrowitz, Washington, D. C.; C. M. Connor, Robert F. Nelson and L. Gustin, W. Conshohocken, Pa.; John King, Russell Morehouse, Walter Thompson, Robert Smith, A. E. Wangel, E. J. Albert, U. Jacobsen, R. M. Bates, Henry Childers, Robert Stewart, Jr.; F. W. Varden, C. A. Shubert, Harry Holmes, C. W. Rivise, Wm. M. Lee, C. C. Stewart, Geo. Martin and Patrick Donohue, Philadelphia, Pa.; James d'A. Clark and F. W. Brainerd, Chester, Pa.; O. C. Cordes, G. C. Walker and Charles Ellis, Downingtown, Pa.; H. F. Mahaley, Paul Koenig, Russell H. Bentz and A. J. Luettgen, Spring Grove, Pa.; A. L. M. Bixler, Ward Harrison and C. W. Hoffman, Milford, N. J.; J. F. Ohlson, Bridgeport, Pa.; W. M. Shoemaker and Donald Gibson, Yorklyn, Del.; L. K. Burnett, Piermont, N. Y.; Robert Ganin and J. A. Dean, Coatesville, Pa.; Richard Rimback and S. M. Cooper, Pittsburgh, Pa.; Kephart Emenseiser, Arthur J. Arsenault and M. D. Reuben, York Haven, Pa.; J. E. Helquist, Belleville, N. J.; Raymond Ball and L. Hecker, Devon, Pa.; James H. Fritz, Harrison, N. J.; E. E. Helm and Elwood Koontz, Cleveland, Ohio.

Empire State TAPPI Discussed Machinery

The Empire State Section of the Technical Association of the Pulp and Paper Industry met at the New York State College of Forestry, Syracuse, N. Y., Saturday, November 19. John Rich of the Newton Falls Paper Company, presided as chairman.

The following papers were presented: "Drive for Paper Machine at the N. Y. State College of Forestry", by R. J. Koch, of the Morse Chain Company, "Steam Booster Installation on the Paper Machine", by W. E. Anderson, Pennsylvania Pump and Compressor Company, and "Chip Classification", by F. M. Williams, of the Williams Apparatus Company.

Following the dinner T. C. Roberts and V. S. Dennison, of the Beloit Iron Works, showed the sound film depicting the manufacture of paper at the mill of the Southern Kraft Corporation.

There were about one hundred present, including: B. W. Ellis, Earl Knapp, Mr. and Mrs. V. P. Edwardes, Miss Mary Edwardes, W. J. O'Brien, V. Woodside, C. E. Libby, A. E. H. Fair, E. W. Gutliph, John H. Rich, R. F. Huntley, A. L. Ball, W. K. Metcalfe, Carl Apelgren, V. Failmezger, James Coghill, E. C. Jahn, John Studeny, Wm. Dohne, C. V. Holmberg, M. J. Maguire, S. A. Eyres, E. K. Stilbut, Kon Matchuk, C. P. Donofrio, Walter W. Cooper, Walter F. Reynolds, Jerrold Moyer, J. M. Kelly, R. J. Koch, M. Bremer, Frederick Waite, E. E. Kinne, Geo. Pennock, J. W. Juckett, Robert Wineburgh, Harry Whitman, W. H. Roberts, Jr., S. C. Nagel, Mr. and Mrs. John D. Rue, M. Rice, H. E. Torell, C. W. Clinch, V. S. Dennison, T. C. Roberts, H. P. Cannon, C. J. Johnson, E. J. Johnstone, A. E. Krogh, D. Robertson, Hobart L. Gen, F. C. Goodwill, Lawrence Russell, F. W. O'Neil, F. M. Williams, Dexter Williams, A. B. Julin, F. G. Calkin, H. M. Rice, G. E. Osterheldt, O. F. Lane, R. W. Hynes, J. E. Becker, I. Veldona, E. Boyle, C. D. De Mers, Robert D. Rusch, W. N. Lockwood, I. C. Lockwood, J. J. Thomas, Mr. and Mrs. H. D. Cook, W. Anderson, D. Bush, C. C. Ross, N. C. Ferris, S. E. Mower, E. G. Ruckdeschel, Eugene V. Pate, Thelma Show, Dorothy Stack, Mr. and Mrs. H. Horstmann, Mr. and Mrs. H. R. Wheeler, Robert F. Vokes, Mr. and Mrs. J. D. Haskell, and Mr. and Mrs. Carl Richter.

Smith Kaplan Turbines

In Bulletin No. 139, just issued by the S. Morgan Smith Company, York, Pa., the Smith-Kaplan turbine is described as a more recent development in hydraulic turbines, being a radically different type combining high speed, high power for a given diameter and high efficiency over a wide range of load. Full details and engineering information are presented with a list of representative installations which include leading paper and pulp mills.

Philadelphia Paper Men Meet

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., November 21, 1938—At the November luncheon meeting of the Philadelphia Paper & Cordage Association, held in Adelphia Hotel on Friday, the 18th, the nominating committee under the chairmanship of E. L. Richards of Buffalo Envelope Company, presented its nominees for officers and directors of the Association for 1939, as follows: President, J. R. Howarth of J. R. Howarth Paper Company; Vice-president, John J. Shinners, Acme Specialty Sales Company; Treasurer, T. W. Monteith, J. E. Fricke Company; Secretary, F. M. Kurz, Whiting-Patterson Company. Directors, Joseph H. Miller, Garrett-Buchanan Company, E. K. Lay, E. K. Lay Company, George K. Hooper, Hooper Paper & Twine Company, Harry S. Platt, Denney Tag Company, Frederick I. Brower, Atlantic Gummed Paper Corporation and E. L. Richards, Buffalo Envelope Company. Ballots are being mailed out to the members, and as the voting will be by mail prompt returns are requested so as to expedite all the details incident to the annual election meeting which will take place on December 16th. Spaces are provided on the ballots for alternates, and names listed by the nominating committee are merely its recommendations.

This November meeting was one of the most outstanding of the year, several of the members participating in discussion of plans for the rest of the year. Vincent A. Dirvin, of Paper Manufacturers Company, Inc., spoke briefly but very optimistically regarding general business conditions, stressing particularly the importance of continued cooperative effort among all branches of the paper and cordage business.

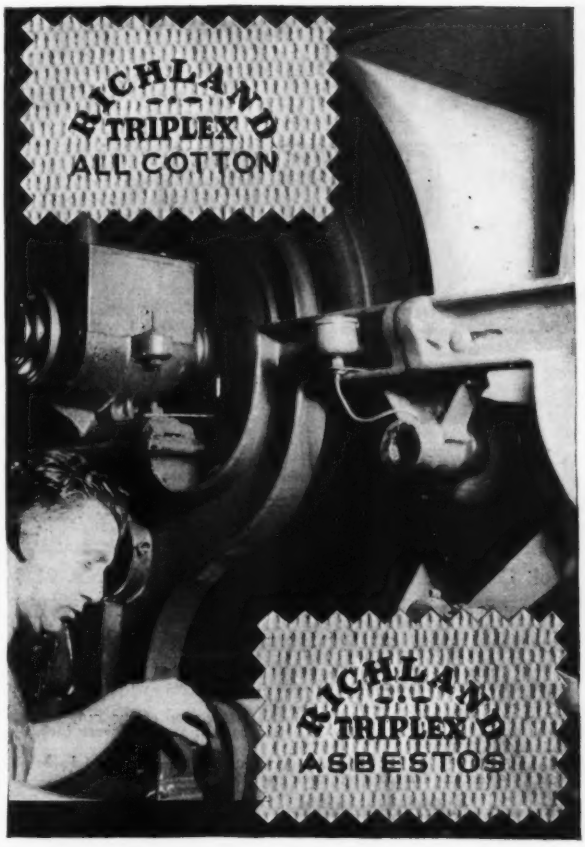
E. K. Lay, immediate past president, and chairman of the Entertainment Committee, reported on the activities pertaining to the Christmas Party. Mr. Lay announced that on Tuesday, December 20th the Association will hold its annual Christmas Party at the Adelphia Hotel, and as has been customary, 60 children from the Salvation Army Settlement House under the supervision of Brigadier Brown, will be treated to a turkey dinner. There will be a Christmas tree with music, entertainment, and most important of all each of these sixty little wards will be presented with gifts of clothing and toys by Santa Claus, impersonated by none other than Leonard Fitzgerald, an active member of the Association.

Canadian View on Trade Treaty

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 21, 1938—The general view on the new trade treaties between Canada, the United States, and Great Britain, seems to be that makers of paper other than newsprint will be heavily penalized by the new agreement and that the printing trades also will suffer.

On the other hand market benefits are expected to help industries as a whole by the concessions granted to lumber entering the United States. The U. S. duty on lumber has been subjected to the maximum reduction, the tariff quota on Douglas fir and western hemlock is abolished, lumber is exempted from requirements of marking and more favorable treatment is accorded red cedar shingles.



What is YOUR Dryer Felt Cost Equation?...

Many factors enter the dryer felt cost equation. Speed, steam pressures, life, and original cost, are only a few of them. No matter what your operating conditions are, RICHLAND TRIPLEX all cotton or asbestos dryer felts offer certain definite advantages. They are uniform and quick drying. Shrinkage and stretch has been reduced to a minimum requiring fewer stops, less adjustments. They are designed for long life. They are really precision fabrics. Specify them. They make fine paper and are likely to have an important bearing upon your mill's dryer felt cost equation.

MT. VERNON-WOODBERRY MILLS, INC.
TURNER HALSEY COMPANY
40 WORTH STREET *Selling Agents* NEW YORK CITY
Branch Offices: SAN FRANCISCO · NEW ORLEANS · CHICAGO · BOSTON · BALTIMORE

PAPER TRADE
ESTABLISHED 1872
JOURNAL

Reg. U. S. Pat. Off.

George S. Macdonald, Pres. *Joseph P. Horgan, Secy.*
Executive and Editorial Offices, 15 West 47th St., New York, N. Y.

Henry J. Berger
EDITOR

Ronald G. Macdonald
Editor Technical Section

Lynne M. Lamm
Washington Correspondent

Per Copy, 10 cents — United States, Per Annum, $4.00
Canada and Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. CVII New York, November 24, 1938 No. 21

COMING EVENTS IN THE PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

LABOR AND BUSINESS

As business continues to improve and more optimism is apparent in the major industries, the uncertain railroad situation and the part labor and the Wagner Labor Relations Act may play in the future, are reminders that many major problems must be solved. The result of the recent election has brought forward a more powerful group of conservative minds in both parties and should serve to check the activity of the more radical New Dealers. There is reason to expect that in the coming year some of the more severe restrictive labor measures inaugurated in the last two years may be modified to give business a little more freedom by the new set-up in the Congress which convenes the first week in the new year.

There is, unfortunately, no hope at this time that the Wagner Act or the Wages and Hours Law will be repealed, but it is very likely that the more objectionable features in these laws may be changed. Organized labor, with dissension between the C. I. O. and the A. F. of L., is less aggressive and with the unions on the defensive less labor trouble may be expected as industrial activity increases.

In the opinion expressed by the Chamber of Commerce of the United States: "The new tendency of business to take the initiative in solving its own problems, independent of government, is one of the most significant and encouraging developments in the current recovery movement. Visible signs of a reasserted business leadership are appearing on a number of fronts. Through industry conferences and other forms of cooperative action, business today is exhibiting greater self-reliance in meeting new conditions and new problems than it has shown at any time recently. Apparently, a large segment of American labor is thinking along somewhat similar lines and is showing a disinclination to have the government interfere further in its affairs."

The Wagner Act, however, must continue to act as a barrier between the cooperation of management and labor, not only through the decisions of the Labor Relations Board, which are termed arbitrary and unfair to employers, but because of inequalities in the Act itself. Although the Labor Relations Board has declared itself unprepared to make any recommendations for any change in the Act, on the ground that no revisions are needed, the palpable unfairness of the many decisions rendered by the Board makes it imperative that the Wagner Act be amended to provide equality for the employer. As the law is now enforced the decisions of the Board clearly indicate that too much is left to the discretion of the arbiting body and that the Wagner Act should be changed to insure justice to employer as well as to employee.

An example of the unjust interpretation of the faulty Wagner Act is revealed in the brief presented to the Supreme Court of the United States by the National Labor Relations Board asking for a reversal of the decision of the Circuit Court of Appeals in the Fansteel Metallurgical case. In that decision the Board's order to reinstate employees who engaged in a sit-down strike in February 1937, with back pay from the date of refusal to reinstate, was set aside. In its brief the Board stated: "If employee misconduct terminates their status as employees under the Act and prevents the Board from issuing remedial orders to correct unfair labor practices, a large field in which the Board's activities are of the most vital importance are put beyond the powers intended to be conferred upon it by Congress."

That is to say, the Labor Relations Board states that misconduct on the part of employees is not included within the provisions of the Wagner Act, but that the Board must issue remedial orders when employers are deemed guilty of any violation of the right of collective bargaining, even if on a technicality. If this argument for the enforcement of the Wagner Act is upheld by the Supreme Court, which seems highly improbable, the Act must be amended to provide more equitable consideration for the rights of the employer.

In commenting on the rights of the employer, the Chamber of Commerce of the United States in a

recent issue of its publication, the *Washington Review*, says in part: "The Labor Relations Act says that a person whose work has ceased in connection with a current labor dispute, or because of an unfair labor practice, remains an employee. The Board takes the position that such a person cannot be discharged by the employer even for illegal acts, and consequently can at the Board's order be returned to work. In asking the Supreme Court's review, the Department of Justice apparently argues that strikers cannot under the Labor Relations Act lose their status as employees regardless of the amount of violence in which they indulge. The lower federal court has taken the opposite view, that an employer can effectively discharge a person who goes on strike and engages in unlawful acts for which he is held accountable in the courts".

And from the far West comes a surprising item of news. Electors in three Pacific Coast States in the November elections voted on proposed laws to restrict picketing in industrial disputes. What the voters of Oregon thought of strikes and picketing was expressed by a majority of 50,000 votes in an election in which approximately 350,000 ballots were cast, the tally representing 196,316 votes for and 147,090 against the Anti-Strike Bill. That law prohibits strikes and picketing except by a majority of a company's employees in a direct dispute over wages, hours and working conditions; limits the collection of money to the actual needs of the union and requires a strict accounting of union funds; forbids union intimidation or coercion of non-union workers and prevents union interference with any lawful commercial, manufacturing or farming operation. Similar proposals were defeated in the states of Washington and California.

Newspapers opposed the measure and the A. F. of L. and the C. I. O. plan separate tests in the courts against the law. The contention will be advanced that the measure is a violation of the State and Federal Constitutions and conflicts with such national laws as the Wagner Act and the Norris-La Guardia anti-injunction statute. The Oregon Federation of Labor contends the law will prevent collective bargaining and place workers at the mercy of unscrupulous employers.

A surprising feature of the election was that a heavy vote was cast for it in districts largely inhabited by laboring men and their families. Sponsors of the bill consider its passage a vindication of their claim that the rank and file in labor unions have been bludgeoned into line by strong-arm methods. The Secretary of the State Federation of Labor charges that the measure was put over by propaganda financed by anti-union employers. Partisans of labor look to the United States Supreme Court, confident that that tribunal will nullify it.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

Months	1938(c)	1937(c)	1936	1935	1934
January	63.9%	90.3%	76.1%	65.8%	.....
February	68.7%	90.1%	77.9%	70.0%	.....
March	69.6%	90.3%	76.0%	70.5%	.....
April	68.3%	92.1%	82.3%	70.0%	.....
May	69.0%	90.6%	81.6%	69.4%	.....
June	66.0%	87.3%	80.7%	72.3%	.....
July	72.0%	81.8%	77.3%	64.9%	.....
August	77.2%	82.9%	81.5%	70.9%	.....
September	76.3%	78.6%	80.5%	71.9%	58.2%
October	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	61.9%	88.0%	75.3%	61.7%
December	.....	54.5%	85.9%	71.2%	59.6%
Year Average	.....	80.6%	81.3%	70.5%	.....
First 45 weeks	71.7%	84.6%	80.5%	70.2%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1938		CORRESPONDING WEEKS, 1937	
*October 8	81.6%	October 9	77.0%
*October 15	83.0%	October 16	74.8%
*October 22	83.8%	October 23	73.6%
*October 29	81.8%	October 30	68.8%
*November 5	82.8%	November 6	65.3%
*November 12	80.3%	November 13	61.7%

The following statistics show the number of mills reporting by ratio groups:

Ratio Limits	Number of Mills Reporting, Current Weeks: Oct. 8, 1938	Oct. 15, 1938	Oct. 22, 1938	Oct. 29, 1938	Nov. 5, 1938	Nov. 12, 1938
0% to 50%	57	64	60	55	59	51
51% to 100%	249	242	245	251	228	165
Total Mills Reporting	306	306	305	306	287	216

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours," were as follows:

Mos.	1938 (e)	1937 (e)	1936	1935	Mos.	1938 (e)	1937 (e)	1936	1935
Jan.	55%	80%	61%	61%	July	57%	67%	69%	59%
Feb.	61%	86%	67%	67%	Aug.	66%	74%	75%	65%
Mar.	60%	87%	68%	67%	Sept.	66%	70%	76%	69%
Apr.	57%	89%	70%	61%	Oct.	.....	66%	82%	76%
May	58%	86%	68%	61%	Nov.	.....	56%	79%	70%
June	56%	75%	68%	65%	Dec.	.....	46%	74%	60%

Week end. Oct. 8, 1938—70%
Week end. Oct. 15, 1938—70%
Week end. Oct. 22, 1938—70%
Week end. Oct. 29, 1938—69%
Week end. Nov. 5, 1938—68%
Week end. Nov. 12, 1938—66%

(e) Basic figures revised to include new members of the National Paperboard Assn.

J. A. Church Lectures on Papermaking

CARTHAGE, N. Y., November 19, 1938—An educational lecture on papermaking was given this week to members of the high school industrial arts department by James A. Church, superintendent of Carthage Papermakers Inc. His speech dwelt on mill management and personnel. The industrial arts department here has announced the addition of two pieces of equipment to the papermaking course. A tester used to determine bursting strength of paper and valued highly is now in use. A comparator set has also been added, this being used to determine the akalinity or acidity of stock. Renovations to the wet machine which will give better sheet formation through improved sheet and stock control are now being made. Two new wooden stock vats when installed will supply stock from both sides of the cylinder mold. The students are now making office stationery from rag stock and a sufficient supply will be made to last the remainder of the school year. The making of blotters from rag stock has also been meeting with considerable success.

"*Sure,* changing to GULF'S *higher quality lubricants* has increased our oil bill $20,000 this year...

but...WITH BETTER LUBRICATION *we've cut maintenance costs $200,000!*"

"We've made a big operating saving," says this Vice President, "but that's not the whole story. With Gulf's higher quality lubricants protecting our equipment, *we're giving our customers better service.*"

The dollars and cents savings which result from proper lubrication are important to plant men who strive to operate machinery economically. But there are further benefits of equal importance. The annoyance of frequent shutdowns for repairs and adjustments—and resultant production losses—are avoided when Gulf's higher quality lubricants are applied as recommended by an experienced Gulf engineer. Production schedules are maintained, orders are filled promptly and customers get better service.

No matter what type of mechanical equipment you operate, better lubrication with Gulf's higher quality oils and greases can help you reduce maintenance costs and improve production.

Ask the Gulf engineer who calls at your plant to suggest possible means of placing your lubrication on a more efficient basis. You will not be obligated in any way, so take advantage of this money-saving service at once. Gulf Oil Corporation—Gulf Refining Company—Gulf Building, Pittsburgh, Pa.

GULF INDUSTRIAL LUBRICATION

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Review Of The Paper Industry Literature

Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Paper Specialties

Impregnating Bag Paper with Cuprammonium Solution of Naphthenic Acids. D. I. Belyai. Bumazhnaya Prom. 15, no. 7:45-48 (1937); C.A. 32:2350.—Preliminary laboratory and factory tests are described for the reenforcement of sized paper (18-25° freeness) and kraft paper, used in making bags, with a cuprammanium solution of naphthenic acids (acids 203.4, copper oxide 58.3, ferric acid 5.4 and ammonium hydroxide 52.7 g./1. A paper sheet was immersed in the solution for 15 seconds to 5 minutes, the excess solution was allowed to drain and the sheets were dried in a drying oven at 80-100° for 3-5 minutes and then tested. The treated paper showed no permeation by water after 72 hours of exposure as compared with 3 to 4 hours for papers impregnated with bituminous and paraffin products. In the permeability to air and in mechanical properties the treated paper was inferior to the untreated paper.—C.J.W.

Need of Condenser of Finer Thickness. V. T. Renne. Bumazhnaya Prom. 15, No. 5:52-56 (1937); C. A. 32:2347.—Improvements are suggested in the production of Malinsk condenser paper equal to foreign products.—C.J.W.

Fireproofing Impregnation of Fiberboard. N. N. Mal'tsev. Bumazhnaya Prom. 15, No. 7:48-52 (1937); C. A. 32:2315.—The fireproofing of paperboards by impregnation with various chemicals is discussed from the technical and economical viewpoints.—C.J.W.

Utilization of Paraffin in the Correct Way. Papier-Ztg. 63, No. 11:188 (Feb. 5, 1938); B. I. P. C. 8:314.—Attention is drawn to odor troubles experienced with certain paraffined products used for wrapping foodstuffs, drugs, etc. The trouble may be greatly reduced when the paraffin is only heated a few degrees above its melting point; rapid cooling and solidifying may be prevented by heating the articles to be coated. Repeated heating may also result in bad odors; therefore, only the amount required should be melted. Not only will the portion which has been heated for several times acquire a bad smell, but it will also transfer the odor to fresh paraffin when mixed with the same.—C.J.W.

Paper for Artists and Technicians. Kurt H. Warnecke. Papier-Ztg. 63, No. 3:50-51; No. 4:57-68 (Jan. 8, 12, 1938); B. I. P. C. 8:303.—The author discusses the following types of paper: drawing paper with special reference to water color drawing paper, tracing papers including natural and oil tracing papers, tracing linen, heliographic paper, graph paper, logarithm paper, and various kinds of chart and map paper. Describes the raw materials and sizes in which these papers are manufactured and gives hints for their correct storage in cool and dry rooms; moist cellars are not suitable.—C.J.W.

Properties of Pigmented Bond Papers. William R. Willets and Richard T. Bingham. Paper Trade J. 106, No. 10: 47-49 (March 10, 1938).—Data are presented on the physical and mechanical properties of titanium-pigmented bond papers and of unpigmented papers made under as nearly as possible identical conditions. It is concluded that the addition of titanium pigments in the amounts required to obtain the desired whiteness and opacity characteristics has only a very slight effect on the mechanical properties of the paper, which is very much less than that of the amounts of other fillers which would be required to obtain the same opacifying and whiteness effects.

Progress on the Subject of the Manufacture of Special Papers. A Foulon. Wochbl Papier, 68, No. 41: 774-75 (Oct. 9, 1937).—In the manufacture of water-proof papers by the use of asphalt, bitumen, tar, etc. the new emulsifying agents are discussed giving their advantages over earlier means. The overcoming of the disadvantages of paste emulsions are mentioned. Cellulose derivatives mixed with caoutchouc, oils, fats or waxes which are made homogeneous through the presence of solvents, are used in the manufacture of water-proof papers. Papers that are coated with lacquers are water-proof only on the top and bottom surfaces but the edges allow moisture to penetrate within the paper. Cellulose esters or cellulose ethers will penetrate into the paper by means of hot calendering. Methods and chemical used in making paper fire-proof are also discussed. In several of the above, the original patent numbers are given.—J.F.O.

A Survey of the American Literature in the Field of Cellulose and Related Subjects for 1933 Through 1937

By Harry F. Lewis[1]

At the request of the Committee on Cellulose and Allied Substances of the National Research Council, the following review has been prepared of the research carried on in the United States during the past five years in the field of cellulose and related subjects. No attempt has been made to incorporate patent literature, for so many patents in the above field are issued each year as to make the undertaking too great either for the time of the reviewer or for the space to be devoted to its publication.* Only the work done in the United States has been included, and because of the library facilities available to the reviewer, somewhat more stress has been paid to the developments as they relate to the pulp and paper industry, rather than to particular application in the field of plastics and rayon. It is felt, however, that the most important articles have been covered.

The Institute of Paper Chemistry, in its current periodical file, has 157 periodicals, and these are continuously abstracted as they appear. These abstracts have been drawn on heavily by the reviewer. Acknowledgment is made to Dr. C. J. West, Editor of The Institute of Paper Chemistry, for his help and to Miss Edith Stroschneider, Librarian of The Institute of Paper Chemistry, for her excellent abstracts.

The topics covered by this review are presented in the following order:

Wood
Cellulose
Cellulose Esters and Ethers
Cooking Process
Lignin
Sulphite Process
Waste Sulphite Liquor
Alkaline Cooking
Groundwood Pulp
Bleaching
Beating and Hydration
Pulp Properties and Pulp Testing
Sizing
Paper Properties
Permanence
Chemical Testing
Fiber Identification
Dyes and Dyeing
Rayon
Paper and Paper Treatments
Cellulose Membranes and Fibers

Wood

The source of future wood cellulose supplies in the United States is a matter of general interest. Curran *(1)* has made a survey of the situation and discusses the possible use of Engelmann spruce, ponderosa pine, redwood, and the western cedars in the remote areas of the country. Munger *(2)*, Davis *(3)*, Hanzlik *(4)*, Lewis *(5)*, and Lodewick *(6)* discuss wood stands of the Pacific Northwest and the conversion of these into various forest products.

Demmon *(7)* discusses the present place and the future possibilities of the forests in the industrial economy in the South. The following policies are recommended: There should be no greater installation of paper mills than the South can support from timber not needed for establishing forest-using industries. New pulp mills should be well distributed throughout the region and not concentrated in restricted areas. A very comprehensive survey of the forest situation in the lower South is given by Eldredge *(8)*, and a review of the supplemental relationships in forest utilization between the requirements of southern pine for naval stores and wood pulp production has been presented by Wackerman *(9)*.

(1) Curran, C. E., *Paper Mill* 57, No. 43: 24 (Oct. 27, 1934).
(2) Munger, T. T., *Paper Trade J.* 98, No. 25: 33-36 (June 21, 1934).
(3) Davis, M., *Paper Trade J.* 99, No. 20: 41-2 (Nov. 15, 1934).
(4) Hanzlik, E. J., *Pac. Pulp Paper Ind.* 10, No. 5: 27 (May, 1936).
(5) Lewis, C., *Pac. Pulp Paper Ind.* 10, No. 5: 21-3 (May, 1936).
(6) Lodewick, J. E., *Pac. Pulp Paper Ind.* 10, No. 5: 24-6 (May, 1936).
(7) Demmon, E. L., *Paper Mill* 60, No. 14: 15 (April 3, 1937).
(8) Eldredge, I. F., *Paper Trade J.* 105, No. 18: 93-102 (Oct. 28, 1937).
(9) Wackerman, A. E., *Paper Trade J.* 105, No. 18: 103-6 (Oct. 28, 1937).

Traquair *(10)* presents a very fine survey of the pulp wood supply of the world.

A further general review *(11)* covers wood utilization and the development of sulphate pulp for rayon, pulp for acetylation, waste liquor utilization, gas generation, sugar from waste wood, synthetic lumber, etc. The utilization of by-products waste from the lumbering and paper industries for explosives, plastics, wood flour, and distillation products is outlined by Livingston *(12)* and by Jahn *(13)*.

Humphrey and Siggers *(14)* have investigated the temperature relations of wood-destroying fungi.

Improvement in yield and quality of pulp through the planting of the hybrid poplars developed by the Oxford Paper Company is described by Schreiner *(15)*. These new hybrid poplars are decidedly better than the native poplars for they grow more rapidly, are more easily cultivated, and are more resistant to disease. Many will produce wood with longer average fiber length and higher density than the native poplar used in Maine. They are readily propagated by means of cuttings from one year old sucker shoots. Excellent stands can be established on cut-over forest lands, cleared of slash and weed trees and planted in the spring following the logging operation. Cuttings can be successfully used in moist sites but rooted trees must be used on dry areas.

(10) Traquair, J., *Paper Trade J.* 105: 107-13 (Oct. 28, 1937).
(11) *Chem. Met. Eng.* 44, No. 10: 602-3 (Oct., 1937).
(12) Livingston, L. F., *Pac. Pulp Paper Ind.* 11, No. 4: 22-4 (April, 1937).
(13) Jahn, E. C., *Timberman* 37, No. 9: 5-9, 32 (July, 1936).
(14) Humphrey, C. J., and Siggers, P. V., *J. Agr. Research* 47, No. 12: 997-1008 (December 15, 1933).
(15) Schreiner, E. J., *Paper Trade J.* 100, No. 8: 105-9 (Feb. 1935); *Paper Ind.* 19, No. 2: 156-63 (May, 1937).

Lauer and Youtz *(16)* recommend the use of 40-60 mesh sawdust in the chemical evaluation of pulp woods.

Pillow, Schaeffer, and Pew *(17)* have experimented with compression wood for the production of groundwood pulp. They find that pulp wood containing a large amount of compression wood produces larger quantities of small fibered fractions than wood

[1] Member TAPPI. Dean, The Institute of Paper Chemistry, Appleton, Wis.

* The patent literature is listed annually by West in his Bibliography of Paper Making published by The Technical Association of the Pulp and Paper Industry. The patents for 1935 (no annual volume was issued that year) are to be found in the 1936 Bibliography.

relatively free from it, especially when ground after one year's seasoning. Such pulp is lower in strength than that made from normal wood and is therefore unsuited for the manufacture of specialized products. Curran *(18)* has related the growth conditions and wood structure to the pulping qualities. He emphasizes the fact that the conditions of growth do markedly affect pulp yield and quality and more care in selecting pulpwood is essential if uniformity is to be obtained. Southern pine pulpwood shows the effect of slow and fast growth, the presence of varying percentages of spring, summer and compression wood to an extenuated degree and illustrates the

(16) Lauer, B. E., and Youtz, M. A., *Paper Trade J.* 96, No. 3: 36-7 (January 19, 1933).
(17) Pillow, M. Y., Schaeffer, E. R., and Pew, J. C., *Paper Trade J.* 102, No. 16: 36-8 (April 16, 1936).
(18) Curran, C. E., *Paper Trade J.* 103, No. 11: 36-40 (Sept. 10, 1936).

point to good advantage. These conclusions were reached after a study of sulphite pulps made from four types of loblolly pine (rapid and slow growth with high and low spring wood content). Edwardes *(19)* illustrates the relationship between spruce wood percentage and unbeaten Mullen strength of the pulp. He concludes that wood quality must be regarded the most important single variable affecting pulp quality and that of the finished product. Other variables such as wood density, moisture, acid concentration and maximum temperature fail to show such a relationship.

The work of the Forest Products Laboratory in the evaluation of additional pulpwoods has been continued so as to include the short leaf pine, cajeput, white mangrove, Australian pine, and Cunningham pine. Bray and Paul *(20)* report that chemical analyses of the pulp obtained from the first wood showed no outstanding evidence adverse to the production of good quality pulps of average yield by the kraft process. Curran, Schwartz, and Bray *(21)*, in discussing the kraft cooking of Florida-grown species of the last four, point out that the pulps are short fibered and inferior to pulps from the common pulpwood species.

Articles on the chemistry of wood include a series from the laboratory of the New York State College

(19) Edwardes, V. P., *Paper Trade J.* 104, No. 8: 120, 122 (Feb. 25, 1937).
(20) Bray, M. W., and Paul, B. H., *Paper Trade J.* 99, No. 5: 38-41 (Aug. 2, 1934).
(21) Curran, C. E., Schwartz, S. L., and Bray, M. W., *Paper Trade J.* 98, No. 23: 44-7 (June 7, 1934).

of Forestry. Peterson, Maughan, and Wise *(22)* have investigated the water-soluble polysaccharide from the European larch (*Larx decidua* Null) and established its identity with the carbohydrates from the two American species; namely, an arabogalactan containing 11.63 per cent anhydroarabinose and 81.95 per cent anhydrogalactan. Its separation as an ash-free chemically homogeneous material was effected by electrodialysis. Wise, Hamer, and Peterson *(23)* characterized the water-soluble polysaccharide of eastern larch, and Wise and Unkauf *(24)* the arabogalactan in western American larch. They believe the material isolated is a homogeneous chemical compound.

Carpenter *(25)* has studied the ether-soluble material in sulphite pulp from southern pine, taking up particularly the location of the material in the pulp, its chemical nature, and the possibility of removal by screening out the fines. Anderson and Sherrard *(26)* describe the isolation of a new acid, dehydroperillic acid, from the heartwood of western red cedar. Experimental results show that this compound is an isomer of cuminic acid and a structural formula is suggested. Isenberg *(27)* has related the age and the chemical composition of white fir wood

(22) Peterson, F. C., Maughan, M., and Wise, L. E., *Cellulosechem.* 15, No. 11-12: 109-14 (Dec. 30, 1934).
(23) Wise, L. E., Hamer, P. I., and Peterson, F. C., *Ind. Eng. Chem.* 25, No. 2: 184-87 (Feb., 1933).
(24) Wise, L. E., and Unkauf, H. C., *Cellulosechem.* 14, No. 2: 20-4 (Feb. 5, 1933).
(25) Carpenter, C. H., *Paper Trade J.* 105, No. 16: 42-47 (Oct. 14, 1937).
(26) Anderson, A. B., and Sherrard, E. C., *J. Am. Chem. Soc.* 55, No. 9: 3813-19 (Sept., 1933).
(27) Isenberg, I. H., *J. Am. Chem. Soc.* 58, No. 11: 2231-33 (Nov., 1936).

using a sample 185 years old and dividing it into fractions representing 1-15, 16-40, 41-85, 86-125, 126-160 rings from the periphery, the first three representing sapwood and the others heartwood. Richter *(28)* has investigated the action of salt solution on wood cellulose, particularly wood which has been allowed to float in sea water for some time.

An exceptionally large number of excellent articles on the physical structure of wood, its colloidal characteristics, and penetration have appeared during the last five years. Stamm *(29)* has made measurements of the equilibrium permeabilities of soft wood to air at different relative vapor pressures, and on the basis of these has developed a new means for determining the distributions of size of openings in a porous membrane. With Seborg *(30)* he has measured the apparent compression of water on Sitka spruce and white spruce hard wood sawdust, cotton linters, alpha-cellulose, a normal sulphite pulp, and the same pulp in a highly hydrated condition. The evidence indicates that the compressive forces are of the order of a few thousand atmospheres and demonstrates that absorption compression extends to the fiber saturation point. The same authors *(31)* have treated wood with materials which form synthetic resins, thus minimizing wood shrinkage and swelling. Anti-shrink efficiencies as high as 70 per cent have been obtained when the wood picked up

(28) Richter, E., *Ind. Eng. Chem.* 25, No. 3: 316-18 (March, 1933).
(29) Stamm, A. J., *Physics* 6, No. 10: 334-42 (Oct., 1935).
(30) Stamm, A. J., and Seborg, R. M., *J. Phys. Chem.* 39: 133-42 (1935).
(31) Stamm, A. J., and Seborg, R. M., *Ind. Eng. Chem.* 28, No. 10: 1164-9 (Oct. 1936).

30-50 per cent of its weight of resin. Stamm and Hansen *(32)* have also used for this purpose a water-insoluble oil or molten wax. The process depends upon the primary replacement of water in the wood with Cellosolve and the replacement of this by wax.

Stamm and Loughborough *(33)* have applied thermodynamic methods to the calculation of equilibrium, relative pressure curves, and isotherms, fiber saturation point, etc., with swelling for Sitka spruce. Stamm *(34)* has likewise measured the effect of inorganic salts on the swelling or shrinking of wood, as well as other factors affecting dimensional changes such as result from variations of moisture content.

Buckman, Schmitz, and Gortner *(35)* have studied certain factors influencing the movement of liquids in wood. They include the relative effectiveness of the maximum and average pore diameter of the openings in the pit membrane for woods at different moisture contents, the influence of pressure on the rate of flow of water through wood, and the movement of organic liquids and salt solutions through wood. The diffusion of neutral molecules such as

urea, glycerol, and lactose from aqueous solutions with samples of wood of known capillary dimensions, has been investigated by Cady and Williams *(36)*. Measurements have been made with hard and soft woods in transverse, radial, and semi-tangential sections.

(32) Stamm, A. J., and Hansen, L. A., *Ind. Eng. Chem.* 27: 1480 (1935).
(33) Stamm, A. J., and Loughborough, W. K., *J. Phys. Chem.* 39: 121-32 (1935).
(34) Stamm, A. J., *J. Am. Chem. Soc.* 56: 1195-1206 (1934); *Ind. Eng. Chem.* 27: 401 (1935).
(35) Buckman, S. J., Schmitz, H., and Gortner, R. A., *J. Phys. Chem.* 39: 103-20 (1935).
(36) Cady, L. C., and Williams, J. W., *J. Phys. Chem.* 39: 87-102 (1935).

Thomassen and McCready *(37)* have carried on an x-ray investigation of the penetration of electrolytes into wood. They found penetration to be more rapid in summer wood than spring wood, and the penetration of caustic soda in the wood greater than that of water. The caustic soda penetration was more rapid at 132 deg. C. than at 95 deg. C. Hrubesky and Chidester *(38)* studied the penetration of western hemlock chips by calcium bisulphite. Penetration was found to be accelerated by an increase in the temperature and an increase in the excess of sulphur dioxide content of the liquor. It was more rapid in sap woods than in heart woods, and, to a slight extent, more rapid in oven-dry than moist wood. The temperature at which the chips were burned varied with the acid concentration and the moisture content. At 110 deg. C. the only burning occurred in moist sap wood chips when treated with 8 per cent acid. McGovern and Chidester *(39)* show the effect of chip length in sulphite pulping, choosing western hemlock hard wood. They cooked chips ranging in length from ⅛ to 1⅛ inches, and found that the time of penetration increases in a parabolic manner with increasing chip length. The optimum strength values were reached in pulps from chips ¼ to ½ inch long, but no significant variation in the rate of pulping was noted for digestion with chips of different length.

(37) Thomassen, L., and McCready, D. W., *Paper Trade J.* 97, No. 15: 42-3 (Oct. 12, 1933).
(38) Hrubesky, C. E., and Chidester, G. H., *Paper Trade J.* 98, No. 7: 34-7 (Feb. 15, 1934).
(39) McGovern, J. N., and Chidester, G. H., *Paper Trade J.* 98, No. 18: 41-6 (May 3, 1934).

Cellulose

Physical Properties

Bancroft and Calkin *(40)* have enlarged on the knowledge of the reaction between cellulose and sodium hydroxide solutions. Because of the large errors in the change-in-titer method for determining the degree of absorption, the authors have described two ways for obtaining true absorption by centrifuge methods. Based on their data, they report no indications of a definite compound between cellulose and caustic soda.

Bangham and Lewis *(41)* show that, while water adheres weakly to the mesophyll cell walls in the leaf, organic liquids adhere strongly. In contrast water wets comparatively easily the outer surfaces of the fine vascular bundles of the leaf. Wiertelak and Garbaczówna *(42)* have studied the absorption of organic liquids by wood and cellulose products in order to determine to what extent such absorption interferes with the standard analyses of these products. Alcohols, pyridine, and benzene-alcohol mixtures are absorbed readily and the liquid thus picked up is not lost even after prolonged heating at 105 deg. C. although it may be removed by washing with ether or water. Ether, benzene, and gasoline are not absorbed. Mease *(43)* reports that fibrous materials such as paper extraction thimbles, cotton, rayon, etc., adsorb alcohol and hold an appreciable amount even when dried to constant weight at temperatures above the boiling point of alcohol. Sheppard and Newsome *(44)* discuss the sorption of water vapor by such cellulose preparations as mercerized cellulose, regenerated cellulose, alpha pulp, and cotton cellulose. They find sorption of water to be unaffected by beating. They believe that hydration effects depend upon the increase in external surface which permits closer interlocking of the dried sheet; hence, lower absorption and retention of liquid water result.

(40) Bancroft, W. D., and Calkin, J. B., *J. Phys. Chem.* 39: 1-9 (Jan., 1935).
(41) Bangham, D. H., and Lewis, F. J., *Nature* 139, No. 3530: 1107-8 (June 26, 1937).
(42) Wiertelak, J., and Garbaczówna, I., *Ind. Eng. Chem., Anal. Ed.* 7, No. 2: 110-11 (March, 1935).
(43) Mease, R. T., *Ind. Eng. Chem., Anal. Ed.* 5, No. 5: 317 (Sept., 1933).

Seborg, Simmonds, and Baird *(45)* also have studied the sorption of water vapor by paper making materials. Stocks highly beaten in a beater had higher equilibrium moisture contents than unbeaten pulp. Pebble mill processing, however, yields a stuff less hygroscopic than the unbeaten pulp. This is due, in part at least, to the mineral matter of low hygroscopicity imparted by the pebble mill, which serves to dilute the pulp. Bleaching also produces a marked decrease in hygroscopicity. Seborg *(46)* has made repeated sorption cycles of highly beaten spruce sulphite pulp over the range of relative humidities from 0 to 95 per cent. The hysteresis he believes to be associated with some physical force or molecular characteristic of the cellulose molecules associated with the mechanism of sorption. Recently Hamm and Patrick *(47)* have published isotherms for cellulose which exhibit no hysteresis. Stamm and Hansen *(48)* have determined that the initial bonding force of cellulose materials for water is about twice that of water to itself. The average force with which water is held below the fiber saturation point varies with the cellulose material, being 15.5 kilobars for wood, 14.7 for cotton, and 13.5 for pulp.

(44) Sheppard, S. E., and Newsome, P. T., *Ind. Eng. Chem.* 26, No. 3: 285-90 (March, 1934).
(45) Seborg, C. O., Simmonds, F. A., and Baird, P. K., *Ind. Eng. Chem.* 28, No. 11: 1245-50 (Nov., 1936).
(46) Seborg, C. O., *Ind. Eng. Chem.* 29, No. 12: 169-72 (Feb., 1937).
(47) Hamm, H. A., and Patrick, W. A., *Textile Research* 6, No. 9: 401-9 (July, 1936).

Stoops *(49)* has determined the dielectric constants and power factor on dried glycerol-free cellophane for a wide range of temperature and frequency. Cellophane is found to have a dielectric constant nearly twice that of cellulose acetate. Shutt and Mack *(50)* find that glycerol and the glycols used to soften cellophane are held by adsorption at the end of the cellulose micelles. Based on this the micelles of cotton cellulose have three times the length of those of the regenerated cellulose in cellophane.

Sanders and Cameron *(51)* carried out an x-ray study of the unit cell in the cellulose in cotton stalks and cusps, and compared the data with those for cellulose from cotton lint, spruce, pine, and poplar. The unit cell or fundamental structure obtained by a chemical treatment is the same, irrespective of the origin of the cellulose.

(48) Stamm, A. J., and Hansen, L. A., *J. Phys. Chem.* 41, No. 7: 1007-16 (Oct. 1937).
(49) Stoops, W. N., *J. Am. Chem. Soc.* 56, No. 7: 1480-3 (July, 1934).
(50) Shutt, R. S., and Mack, E., Jr., *Ind. Eng. Chem.* 25, No. 6: 687-92 (June, 1933).
(51) Sanders, J. P., and Cameron, F. K., *Ind. Eng. Chem.* 25, No. 12: 1371-73 (Dec., 1933).

Activity in the application of x-ray technic to the problems of cellulose chemistry has been largely centered in two or three laboratories although the major stimulus has come from G. L. Clark's laboratory at the University of Illinois. In a general paper *(52)* he has outlined the accomplishments of a decade of applied x-ray research almost entirely in the field of cellulose fibers. With Parker he has studied the diffraction of x-rays at very small angles by cellulose and rayons *(53)* and the x-ray diffraction study of the products of reaction between liquid ammonia and cellulose *(54)*. This latter report followed an article by Barry, Peterson, and King *(55)*, who found that ramie fibers immersed in liquid ammonia swell and, depending on subsequent treatment, yield one of two different structures as indicated by x-rav diagrams; one is analogous to the structure found by Trogus and Hess in their treatment of cellulose with hydrazine ethylenediamine, and taterамethylenediamine; the other has a striking similarity to that of cellulose hydrate.

Sisson and Clark *(56)* describe an x-ray method for the quantitative comparison of crystallite orientation in cellulose fibers and Sisson, Clark, and Parker *(57)* take up the significance of absorption edges in

(52) Clark, G. L., *J. Soc. Chem. Ind.* 52, No. 16: 336-46 (April, 1933).
(53) Clark, G. L., and Parker, E. A., *Science* 85, No. 2199: 203-4 (Feb. 19, 1937).
(54) Clark, G. L., and Parker, E. A., *J. Phys. Chem.* 41, No. 6: 777-86 (June, 1937).
(55) Barry, A. J., Peterson, F. C., and King, A. J., *J. Am. Chem. Soc.* 58, No. 2: 333-37 (Feb., 1936).
(56) Sisson, W. A., and Clark, G. L., *Ind. Eng. Chem., Anal. Ed.* 5, No. 5: 296-300 (Sept. 15, 1933).
(57) Sisson, W. A., Clark, G. L., and Parker, E. A., *J. Am. Chem. Soc.* 58, No. 9: 1635-38 (Sept., 1936).

the x-ray patterns of native and mercerized cellulose. Additional papers by Sisson include an x-ray study of crystallite orientation in natural cellulose fibers *(58)* and in synthetic fibers from bacterial cellulose membranes *(59)*. He has also suggested a secondary structure for cellulose *(60)*.

McBain and Scott *(61)* have concluded that cellulose derivatives are association colloids like soaps and that association or formation of micelles or more complicated structure appears to be an essential feature of cellulose and its derivatives. Because of this, they question the extrapolation procedure of Staudinger for determining molecular weights. Three articles on the determination of the molecular weights of cellulose and cellulose derivatives have been written by Kraemer and Lansing. The first *(62)* describes their work with the ultra-centrifuge in repeating Stamm's earlier experiments. Their molecular weight values are much higher than those reported on cellulose by Stamm. The second article *(63)* gives a comparison of molecular weight values for cellulose and derivatives with those obtained by viscosity methods and with others in the literature. Lansing and Kraemer *(64)* in the third article consider the

(58) Sisson, W. A., *Ind. Eng. Chem.* 27, No. 1: 51-6 (Jan., 1935).
(59) Sisson, W. A., *J. Phys. Chem.* 40, No. 3: 343-59 (March, 1936).
(60) Sisson, W. A., *Textile Research* 6, No. 3: 143-51 (Jan., 1936).
(61) McBain, J. W., and Scott, D. A., *Ind. Eng. Chem.* 28, No. 4: 470-3 (April, 1936).
(62) Kraemer, E. O., and Lansing, W. D., *Nature* 133, No. 3371: 870-1 (June 9, 1934).
(63) Kraemer, E. O., and Lansing, W. D., *J. Phys. Chem.* 39, No. 2: 153-68 (Feb., 1935).
(64) Kraemer, E. O., and Lansing, W. D., *J. Am. Chem. Soc.* 58, No. 8: 1471-3 (Aug., 1936).

possible effect of solvation on molecular weight determinations by ultra-centrifuge methods and conclude that there is no greater error introduced in binary solutions than by the conventional methods for ternary solutions. It appears to be possible to evaluate the error in molecular weights determined by sedimentation equilibrium without considering the partial specific volume of solvates or compounds formed by the sedimenting component.

Chemical Properties

Wolfrom and Georges *(65)* have followed the hydrolysis of cellulose with fuming hydrochloric acid by a study of the reactions between the products of hydrolysis and ethyl mercaptan. Changes were determined both by viscosity and polariscopic measurements. Sulphur determinations were used to follow the average molecular size of the hydrolytic products. The data indicate a rapid hydrolysis to surprisingly small units. Glucose diethyl mercaptal first appeared when the hydrolysis was approximately two-thirds completed. Salley *(66)* uses an oxidation study on mannitol as indicating the possible mechanism of the oxidation of cellulose. The evidence is against the oxidation of mannitol in the presence of alkali and ferric salt as a chain reaction; it is therefore indicated, in view of the similarity in reactivity between mannitol and cellulose, that the oxidation of alkali cellulose is not a chain reaction. Because of this,

(65) Wolfrom, M. L., and Georges, L. W., *J. Am. Chem. Soc.* 59, No. 2: 282-86 (Feb., 1937); 60, No. 5: 1026-33 (May, 1938).
(66) Salley, D. J., *J. Phys. Chem.* 38, No. 4: 449-63 (April, 1934).

attempts to prevent the deterioration of cellulose by the addition of inhibitors would probably not work with cellulose. Methods which involve removing positive catalysts or the prevention of catalytic activity would more likely yield desirable results.

The action of heat on cellulose has been studied by Smith and Howard *(67)*. They have established the presence of C_6 ring structures in products obtained by pyrolyzing cellulose at temperatures up to 400 deg. C. Olsen, Ferguson, and Scheflan *(68)* have determined the products formed when cellulose in the form of newspapers is decomposed in an atmosphere of nitrogen and when burned in an excess of air. Elmquist and Downey *(69)* have measured the changes in copper number, methylene blue absorption, fluidity and breaking load of cotton sheeting after being subjected to controlled ironing treatments. The chemical tests determined degradation more readily than did the physical tests.

Holocellulose

The entire carbohydrate fraction of wood has been termed holocellulose by Ritter and Kurth *(70)*. A method is given for isolating holocellulose from maple wood. Kurth and Ritter *(71)* extend the work to include spruce holocellulose. This material, after

(67) Smith, R. C., and Howard, H. C., *J. Am. Chem. Soc.* 59, No. 2: 234-6 (Feb., 1937).
(68) Olsen, J. C., Ferguson, G. E., and Scheflan, L., *Ind. Eng. Chem.* 25, No. 6: 599-603 (June, 1933).
(69) Elmquist, R. E., and Downey, K. M., *Rayon Textile Monthly* 17: 814-20 (1936); 18: 41, 91 (1937).
(70) Ritter, G. J., and Kurth, E. F., *Ind. Eng. Chem.* 25, No. 11: 1250-53 (Nov., 1933).
(71) Kurth, E. F., and Ritter, G. J., *J. Am. Chem. Soc.* 56, No. 12: 2720-3 (Dec., 1934).

hydrolysis with one per cent sulphuric acid, leaves a carbohydrate residue comparable with Cross and Bevan cellulose—the fraction thus removed being the easily hydrolyzed hemicellulose fraction. Bird and Ritter *(72)* also report on white oak holocellulose. About 20 per cent of the methoxyls and all the

carboxyls and acetyls of the wood are in white oak holocellulose. A much shorter procedure for the isolation of holocellulose is that described by Van Beckum and Ritter *(73)*. This has been extended to include rapid methods for Cross and Bevan cellulose and lignin by the same authors *(74)*.

Of interest to laboratories engaged in testing regenerated celluloses, as well as cellulose derivatives, is the article by Levey *(75)*, an abstract of which appears in *Chemist-Analyst (76)*. A similar article has been published in *Plastic Products (77)*.

The fermentation of cellulose by thermophilic organisms to produce ethanol is the subject of an article by Veldhuis, Christensen and Fulmer *(78)*. Highest yield under optimum conditions amounted to 26 per cent ethanol and 24 per cent acetic acid.

(72) Bird, C. D., and Ritter, G. J., *J. Am. Chem. Soc.* 59, No. 5: 802-3 (May, 1937).
(73) Van Beckum, W. G., and Ritter, G. J., *Paper Trade J.* 104, No. 19: 49-50 (May 13, 1937).
(74) Van Beckum, W. G., and Ritter, G. J., *Paper Trade J.* 105, No. 18: 127-30 (Oct. 28, 1937).
(75) Levey, H. A., *Chem. Industries* 36, No. 5: 423-6 (May, 1935).
(76) Levey, H. A., *Chemist-Analyst* 25, No. 1: 14-17 (Jan., 1936).
(77) *Plastic Products* 10, No. 2: 60 (Feb., 1934).
(78) Veldhuis, M. K., Christensen, L. M., and Fulmer, E. I., *Ind. Eng. Chem.* 28, No. 4: 430-3 (April, 1936).

Cellulose Esters and Ethers

Recent developments on the preparation of cellulose derivatives are described by Montonna *(79)* who presents a list of 104 references in his bibliography. Craik *(80)* suggests that during times of national emergency benzyl- and ethylcellulose may be substituted for nitrocellulose in the manufacture of plastics, lacquers, etc. The sorption of organic vapors by synthetic resins on the one hand and cellulose derivatives on the other is described by Winning and Williams *(81)*. Sheppard and Newsome *(82)* have investigated the change in physical properties of a series of cellulose tri-esters from the acetate to the stearate. As the side chain increases in length, the cellulose character is progressively submerged. These same authors review the formation of films from cellulose derivatives *(83)*.

Weber and Hill *(84)* describe the best method for the care and storage of acetate and nitrate motion picture film and slide-film. Hill and Weber *(85)* find that acetate film possesses the same degree of stability toward an accelerated aging test as does permanent paper. Phillips *(86)* has developed a method

(79) Montonna, R. E., *Paper Trade J.* 103, No. 23: 35-9 (Dec. 3, 1936).
(80) Craik, James, *Chem. & Ind.* 56, No. 25: 565-6 (June 19, 1937).
(81) Winning, C. H., and Williams, J. W., *J. Am. Chem. Soc.* 55, No. 9: 3560-69 (Sept., 1933).
(82) Sheppard, S. E., and Newsome, P. T., *J. Phys. Chem* 39, No. 1: 143-52 (Jan., 1935).
(83) Sheppard, S. E., and Newsome, P. T., *J. Soc. Chem. Ind.* 56, No. 8: T256-61 (Aug., 1937).
(84) Weber, C. G., and Hill, J. R., *J. Research Natl. Bur. Standards* 17, No. 5: 753-60 (Nov., 1936).
(85) Hill, J. R., and Weber, C. G., *J. Soc. Motion Picture Engrs.* 27, No. 6: 677-90 (Dec., 1936).
(86) Phillips, A. J., *Ind. Eng. Chem., Anal. Ed.*, 416-9 (Nov. 15, 1935).

for estimating the increase in specific surface of beaten nitrocellulose by determining the differences in dye adsorption. The preparation of nitrocellulose from purified wood fiber has been described by Schur and Hoos *(87)*. Kirkpatrick *(88)* recommends the use of triphenyl phosphate for the preparation of flame-retarding cellulose acetate.

A number of interesting papers have appeared on the subject of specific cellulose ethers. The mechanism of cellulose benzylation, for example, is described by Lorand and Georgi *(89)*. A new method for the preparation of water-soluble ethers has been developed by *Bock (90)*. This consists in treating cellulose in a quaternary ammonium hydroxide with an alkyl halide or sulphate. By the new method, ethers containing only 0.6-0.7 alkyl groups per glucose are soluble in water, whereas by the alkali cellulose process the introduction of 1.2 to 1.6 groups is necessary. The explanation for the difference in behavior is that a more even distribution of alkyl groups is obtained when cellulose is alkylated in solution. A brief summary of research work on the hydroxyalkyl ethers of cellulose is presented by Schorger and Shoemaker *(91)*.

(87) Schur, M. O., and Hoos, B. G., *Ind. Eng. Chem.* 29, No. 1: 26-44 (Jan., 1937).
(88) Kirkpatrick, A., *Chem. Industries* 36, No. 4: 319-20 (April, 1935).
(89) Lorand, E. J., and Georgi, E. A., *J. Am. Chem. Soc.* 59, No. 7: 1166-70 (July, 1937).
(90) Bock, L. H., *Ind. Eng. Chem.* 29, No. 9: 985-7 (Sept., 1937).
(91) Schorger, A. W., and Shoemaker, M. J., *Ind. Eng. Chem.* 29, No. 1: 114-7 (Jan., 1937).

Ethyl cellulose as a new material is discussed by De Bell *(92)* and also by Koch *(93)*. Bass and Kauppi *(94)* evaluate the mechanical properties of ethyl cellulose films by their load-elongation curves. From data on yield points, total elongation, and ultimate tensile strength, the influence of eighteen commercial plasticizers on film properties is compared, and from these data plasticizers are indicated. Kauppi and Bass *(95)* have also developed a considerable amount of information on the viscosity-concentration relations in ethyl cellulose solutions.

(92) De Bell, J. M., *Chem. Met. Eng.* 44, No. 1: 31-2 (Jan., 1937).
(93) Koch, William, *Ind. Eng. Chem.* 29, No. 6: 687-90 (June, 1937).
(94) Bass, S. L., and Kauppi, T. A., *Ind. Eng. Chem.* 29, No. 6: 678-86 (June, 1937).
(95) Kauppi, T. A., and Bass, S. L., *Ind. Eng. Chem.* 29, No. 7: 800-3 (July, 1937).

Cooking Process

Aronovsky and Gortner have continued their excellent series of papers on the chemistry of the cooking process, and have reported the results on cooking wood with sodium sulphate *(96)*; sodium thiosulphate *(97)*, sodium sulphite *(98)*, sodium sulphide, *(99)*, sodium hydroxide and trisodium phosphate *(100)*, and finally the pulping of wood with alcohols and other organic reagents *(101)*.

Gortner and McNair *(102)* have isolated the alpha-cellulose from eight different woods after cooking with sodium hydroxide and sodium sulphite and bleaching. Each subsequent alpha-cellulose treatment indicated a lowered alpha-cellulose content. These, on plotting, fell in straight lines, the slopes of which were characteristic for each pulp.

Two papers involving the cooking of rags have appeared from the laboratories of The Institute of Paper Chemistry; Laughlin *(103)* has carried out a

(96) Aronovsky, S. I., and Gortner, R. A., *Ind. Eng. Chem.* 25, No. 3: 305-10 (March, 1933).
(97) *Ind. Eng. Chem.* 25, No. 11: 1260-65 (Nov., 1933).
(98) *Ind. Eng. Chem.* 25, No. 12: 1349-54 (Dec., 1933).
(99) *Ind. Eng. Chem.* 26, No. 1: 61-5 (Jan., 1934).
(100) *Ind. Eng. Chem.* 26, No. 2: 220-26 (Feb., 1934).
(101) *Ind Eng. Chem.* 28, No. 11: 1270-76 (Nov., 1936).
(102) Gortner, R. A., and McNair, J. J., *Ind. Eng. Chem.* 25, No. 5: 505-10 (May, 1933).
(103) Laughlin, E. R., *Paper Trade J.* 97, No. 17: 39-52 (Oct. 27, 1933).

fundamental study of the rag cooking operation, especially at higher temperatures and pressures and describes in some considerable detail the chemical changes taking place in the rags during cooking and relates these with strength characteristics of handsheets made from the cooked rags. Lehner *(104)* has developed a modified process for cooking blue denim which involves a second stage treatment with sodium hydrosulphite. This process yields an easily-bleached stock of high strength characteristics.

The production of pulp from the whole cotton plant through a pre-treatment with nitric acid followed by a mild alkaline cook has been suggested by Macormac and Cameron *(105)*. Macormac *(106)* further reviews the work. The feasibility of the proposal is discussed critically by Murdock *(107)*.

(104) Lehner, S., *Paper Trade J.* 96, No. 3: 28-32 (Jan. 19, 1933).
(105) Macormac, A. R., and Cameron, F. K., *Ind. Eng. Chem.* 29: 96 (1937).
(106) Macormac, A. R., *Am. Dyestuff Reptr.* 26, No. 14: 389-96 (July 12, 1937).
(107) Murdock, H. R., *Paper Trade J.* 96, No. 14: 41-2 (April 6, 1933).

Lignin

Excellent reviews on the status of the broad lignin problems have been presented by Phillips *(108)* and by Fuchs *(109)*. The first of these is a comprehensive article with a bibliography of 304 references. In the second, comments are made on the principal existing theories of the chemical composition of lignin and formulas are suggested.

Several rather complete investigations have been made covering the analytical methods followed in lignin determinations. In the first, Billington, Simmonds, and Baird *(110)* have compared the original Forest Products method, modified Forest Products method, the Ross-Potter method of the Canadian Forest Products Laboratory, and the Willstätter-Zachmeister method. They recommend the modified Forest Products method for routine purposes. Goss and Phillips *(111)* and Phillips and Goss *(112)* have studied the variables of the fuming hydrochloric acid method and have compared their recommended procedure on wheat, straw, and spruce wood with the Schwalbe method, the modified Forest Products Laboratory method and the Peterson, Walde, and Hixon modification of the 72 per cent sulphuric acid method, using pretreated samples. They believe that the percentage of lignin in plant material, as found by their modification of the fuming hydrochloric acid method on material previously given successive extractions with alcohol-benzene, hot water, and 1 per cent hydrochloric acid, is a close approximation to the true lignin content of the plant material. Ritter and Barbour *(113)* have shown that the accuracy of the determination of lignin in wood by means of the 72 per cent sulphuric acid method is affected by the amount and kind of extraneous materials incompletely removed in preliminary treatment of the wood. They recommend for North American woods successive extractions with 95 per cent alcohol, alcohol-benzene, and hot water. Cohen and Harris *(114)* warn of the possibility of mild hydrolysis of the wood, even by hot water, through removing small amounts of lignin in the pre-treatments before the 72 per cent sulphuric acid method. Harris *(115)* believes that the lowering of the lignin value after extraction of the sample with alkali is due to the actual removal of lignin by the caustic solution. He does not favor caustic extraction previous to lignin determination.

(108) Phillips, M., *Chem. Reviews* 14, No. 1: 103-70 (Feb., 1934).
(109) Fuchs, W. M., *Paper Trade J.* 102, No. 13: 33-36 (March 26, 1936).
(110) Billington, P. S., Simmonds, F. A., and Baird, P. K., *Paper Trade J.* 96, No. 4: 30-33 (Jan., 1933).
(111) Goss, M. J., and Phillips, M., *J. Assoc. Official Agr. Chem.* 19: 341-50 (1936).
(112) Phillips, M., and Goss, M. J., *J. Assoc. Official Agr. Chem.* 19: 350-56 (1936).

The location of lignin in wood has been studied by a number of investigators. Ritter *(116)* points out that the major portion is found in the middle lamella, the remainder in the cell wall. A. J. Bailey *(117)* has used the micro manipulator to isolate to 0.5 mg. of the middle lamella of the Douglas Fir. This was found to contain 71.38 per cent lignin and 14.21 per cent pentosan.

(113) Ritter, G. J., and Barbour, J. H., *Ind. Eng. Chem., Anal. Ed.* 7, No. 4: 238-40 (July 15, 1935).
(114) Cohen, W. E., and Harris, E. E., *Ind. Eng. Chem., Anal. Ed.* 9, No. 5: 234-5 (May, 1937).
(115) Harris, E. E., *Ind. Eng. Chem., Anal. Ed.* 5, No. 2: 105-6 (March 15, 1933).
(116) Ritter, G. J., *Paper Ind.* 16, No. 3: 178-83 (June, 1934).
(117) Bailey, A. J., *Ind. Eng. Chem., Anal. Ed.* 8, No. 1: 52-4; No. 5: 389-91 (Jan., Sept., 1936).

Kerr and Bailey *(118)* present an excellent discussion of the structure, optical properties, and chemical compositon of the middle lamella. Bailey and Kerr *(119)* then show how the lignin residues may be used in revealing the secondary wall structure of a fiber.

Carpenter and Lewis *(120)* have shown that in jack pine a portion of the lignin of the middle lamella appears to have the form of a spirally wound sheath. Lewis and Richardson *(121)* defibered spruce chips by a mild neutral sulphite process, obtaining a raw pulp containing 22.2 per cent lignin. This was delignified to various degrees through variations in the time of cooking by the kraft process. The application of swelling technic demonstrated that, when the lignin had been lowered to 15.9 per cent, the middle lamella sheath began to disappear. At 8.6 per cent lignin it was largely removed. Bixler *(122)* has cooked cross sections of spruce, jack pine, and aspen and found that middle lamella lignin is removed in preference to cell wall lignin by the alkaline processes, while the sulphite process apparently takes out both middle lamella and cell wall lignin without preference. These last two papers were reported in brief at the 1937 Fall Meeting of the Technical Association of the Pulp and Paper Industry at Savannah.

(118) Kerr, T., and Bailey, I. W., *J. Arnold Arboretum* 15, 327-49 (1934).
(119) Bailey, I. W., and Kerr, T., *J. Arnold Arboretum* 18, No. 4: 261-72 (Oct., 1937).
(120) Carpenter, C. H., and Lewis, H. F., *Paper Trade J.* 99, No. 3: 37-42 (July 19, 1934).
(121) Lewis, H. F., and Richardson, C. A., *Paper Trade J.* 105, No. 27: 37-38 (Dec. 30, 1937).
(122) Bixler, A. L. M., *Paper Trade J.* 105, No. 27: 37-38 (Dec. 30, 1937).

Loughborough and Stamm *(123)* describe the molecular properties of lignin solutions as derived from viscosity, osmotic pressure, boiling point raising, diffusion, and spreading measurements. They suggest a molecular weight of 3900. Payne, Fukunaga, and Kojima *(124)* have extracted lignin from bagasse by dilute nitric acid. The molecular weight of the nitrolignin as recovered, determined in dioxane by the freezing point method, is 1650 ± 125. It has the approximate formula $C_{67}H_{54}O_{21}(NO_2)_2(OCH_3)_8(OH)_4$. They question the value of methoxylation and acetylation reactions for determining the per cent of hydroxyl in lignin. Carboxyl groups are shown to be absent by electrometric titration curves.

A rather healthy interest has been shown in the chemical behavior of lignin. Harris, Sherrard, and Mitchell *(125)* have pointed out that lignin isolated by the cold sulphuric acid method is produced quantitatively, is free from carbohydrates and contains all the methoxyl not accounted for in the carbohydrates of the wood. Differences in behavior between maple and spruce lignins are pointed out. Harris *(126)*

(123) Loughborough, D. L., and Stamm, A. J., *J. Phys. Chem.* 40, No. 9: 1113-32 (Dec., 1936).
(124) Payne, J. H., Fukunaga, E., and Kojima, R., *J. Am. Chem. Soc.* 59, No. 7: 1210-13 (July, 1937).
(125) Harris, E. E., Sherrard, E. C., and Mitchell, R. L., *J. Am. Chem. Soc.* 56, No. 4: 889-93 (April, 1934).

later shows that these differences exist between lignins of other hard and soft woods. On the basis of ten methoxyl groups for the fully methylated lignin, hard wood lignin isolated as above contains six, and soft wood lignin five methoxyl groups. A. J. Bailey *(127)* has examined the lignin of Douglas fir in the light of Klason's theory. He indicates that this wood should become a source of sulphite pulp, although it is more difficult to delignify than spruce. Phillips and Goss have continued their excellent series on the chemistry of lignin. One paper *(128)* describes the oxidation products of alkali lignin from corn cobs; using nitric acid or hydrogen peroxide, oxalic acid is the chief product. Another contribution *(129)* characterizes the lignin from barley straw. Formaldehyde is definitely isolated from the distillation of barley lignin with 12 per cent hydrochloric acid, pointing to the probable presence of a methylene group. Walde and Hixon *(130)* present evidence to account for the presence of a secondary group of the type $CH_3CH(OH)$ in the molecule, through a study of the oxidizing effect of alkaline iodine solutions. Fuchs *(131)* has prepared phenol

(126) Harris, E. E., *J. Am. Chem. Soc.* 58, No. 6: 894-6 (June, 1936).
(127) Bailey, A. J., *Paper Ind.* 16, No. 7: 480-83 (Oct., 1934).
(128) Phillips, M., and Goss, M. J., *J. Am. Chem. Soc.* 55, No. 8: 3466-70 (Aug., 1933).
(129) Phillips, M., and Goss, M. J., *J. Am. Chem. Soc.* 56, No. 12: 2707-10 (Dec., 1934).
(130) Walde, A. W., and Hixon, R. M., *J. Am. Chem. Soc.* 56, No. 12: 2656-59 (Dec., 1934).
(131) Fuchs, W. M., *J. Am. Chem. Soc.* 58, No. 4: 673-80 (April, 1936).

lignins and methoxylglycol lignins and has calculated their molecular weights, which are in good agreement with those of Brauns, Hibbert, and coworkers. Brauns *(132)* shows that these values agree also with the equivalent weights of Freudenberg's lignin sulphonic acid.

Definite contributions to the mechanism of bleaching and cooking have been made by Brauns. He has shown *(133)* that unbleached pulps are improved in brightness by the methylation of one lignin hydroxyl group with diazomethane; the methylated pulps react but slowly with chlorine, are somewhat more stable toward fading with light, and no longer give the normal color reactions for unbleached pulps. In an unpublished paper which D. S. Brown and Brauns presented before the 1937 Fall Meeting of the Cellulose Division of the American Chemical Society *(133a)*, they show that wood methylated by a similar procedure would no longer respond to sulphite or alkaline pulping.

Waksman and Gordon *(134)* have investigated wheat straw lignin prepared by the cold sulphuric acid method—with and without preliminary treatment with dilute acid. They conclude from their work that Hilpert's denial of the existence of lignin as such in the plant has no foundation.

(132) Brauns, F. E., *Paper Trade J.* 103, No. 11: 41-2 (September 10, 1936).
(133) Brauns, F. E., *Paper Trade J.* 103, No. 5: 36-9 (July 30, 1936).
(133a) To be published in *Ind. Eng. Chem.*, 1938.
(134) Waksman, S. A., and Gordon, T. C., *J. Am. Chem. Soc.* 58, No. 6: 969-72 (June, 1936).

Boruff and Buswell *(135)* believe that lignin in its natural state in corn cobs may be fermented anaerobically, while isolated lignin ferments very slowly under identical conditions. Levine, Nelson, Anderson, and Jacobs *(136)* think that reported losses in lignin attributed to microbial decomposition may be explained by the technic and preparation of samples for lignin analysis. They have been unable to develop a specific anaerobic lignin-digesting flora. Waksman and Smith *(137)* have shown that, as plant residues are converted to humus in the soil, the lignin is not lost but is demethoxylated in the process.

(135) Boruff, C. S., and Buswell, A. M., *J. Am. Chem. Soc.* 56, No. 4: 886-88 (April, 1934).
(136) Levine, M., Nelson, G. H., Anderson, D. G., and Jacobs, P. B., *Ind. Eng. Chem.* 27, No. 2: 195-200 (Feb., 1935).
(137) Waksman, S. A., and Smith, H. W., *J. Am. Chem. Soc.* 56, No. 5: 1225-29 (May, 1934).

Sulphite Process

Rue and Sconce *(138)* suggest that an improved bleached sulphite pulp can be obtained by cooking to higher yield of a stronger unbleached pulp which, by reason of prechlorination, can be bleached economically and without sacrifice of superior quality. Swanson *(139)* analyzes the sulphite acid making process from the standpoint of the production of raw acid and the recovery operation. The effect of high sulphur dioxide concentrations and high pressures in sulphite pulping have been studied by McGovern *(140)*. He finds that sulphite cooking liquors containing large amounts of sulphur dioxide increase the rate of penetration and pulping and that the time required to penetrate completely Western hemlock hard wood chips by sulphite liquor was reduced both by increasing the acid concentration and by increasing the temperature. The application of a hydrostatic pressure far in excess of that developed by the steam and sulphur dioxide had no visible effect on the penetration time, the pulping time, or the pulp. Chidester *(141)* has examined the effect of varying the concentration of combined sulphur dioxide in soda base sulphite pulping. He finds that the yields and strength of pulps that have been digested to approximately the same degree in approximately the same time with soda base sulphite liquors of constant initial total sulphur dioxide, passed through a maximum at 2 to 3 per cent of combined sulphur dioxide. Mixtures of sodium monosulphite and bisulphite pro-

(138) Rue, J. D., and Sconce, J. S., *Paper Trade J.* 95, No. 17: 54-62 (Oct. 27, 1932).
(139) Swanson, W. H., *Paper Trade J.* 105, No. 10: 39-40 (Sept. 2, 1937).
(140) McGovern, J. N., *Paper Trade J.* 103, No. 20: 29-42 (Nov. 12, 1936).
(141) Chidester, G. H., *Paper Trade J.* 104, No. 6: 39-42 (Feb. 11, 1937).

duced inferior pulps of low yield, the monosulphite liquors producing the highest strength but the lowest yield. Slash pine heart wood can be pulped with a liquor of high combined sulphur dioxide concentration. Richter *(142)* shows that pulp wood which has been contaminated by the absorption of small quantities of salt from seawater gives a decreased yield, a comparatively small decrease in strength qualities of unbleached pulp but a serious decrease in strength qualities of bleached pulp. The utilization of kraft lime mud for the preparation of bisulphite cooking liquors is described by Kress and Williams *(143)*.

The recovery of sulphur dioxide from waste gases has been carried out by Johnstone and Singh *(144)*. This may involve the handling of quantities of gases up to 1.5 to 2 million cubic feet per minute. The gases are hot and dust-laden and the concentration of sulphur dioxide is very low. Operating costs depend on draft loss, quantity of liquid required for wetting the surfaces, and height of the scrubber. Data from actual installations indicate that some sort of contact surfaces are more efficient than simple spray washers. The essential characteristics of an absorption tower for the scrubbing of the gases are given. Measurements of rates of absorption and draft losses are made for various arrangements of smooth plates, corrugated plates, grid surfaces, and ordinary tower

(142) Richter, E., *Ind. Eng. Chem.* 25, No. 3: 316-18 (March, 1933).
(143) Kress, O., and Williams, E. H., *Paper Trade J.* 104, No. 20: 50-1 (May 20, 1937).
(144) Johnstone, A. F., and Singh, A. D., *Ind. Eng. Chem.* 29, No. 3: 386-97 (March, 1937).

packing. Beuschlein *(145)* considers the recovery of sulphur dioxide, particularly the application of the principles of gas absorption to the sulphite acid tower. Frank and Beuschlein *(146)* have studied the equilibrium relations in the system calcium oxide-sulphur dioxide-water (acid region) at pressures below atmospheric, and Conrad and Beuschlein *(147)* have developed data as to the solubility of sulphur dioxide in calcium bisulphite solutions. The correct composition of a sulphite cooking acid is believed by Weber *(148)* to be of 6 per cent combined sulphur dioxide, 4.75 per cent free sulphur dioxide, and 1.25 per cent combined sulphur dioxide for giving all-around satisfactory results, even in mills cooking wood with high moisture content. Whenever it is economically possible, it is advisable to go to a higher concentration of cooking acids but to keep the concentration of the combined sulphur dioxide down to 1.25 per cent.

(145) Beuschlein, W. L., *Pac. Pulp Paper Ind.* 6, No. 10: 20-21 (June, 1936).
(146) Frank, H. C., and Beuschlein, W. L., *J. Am. Chem. Soc.* 56, No. 12: 2554-62 (Dec., 1934).
(147) Conrad, F. H., and Beuschlein, W. L., *Paper Trade J.* 105, No. 4: 37-40 (July 22, 1937).
(148) Weber, E. A., *Pac. Pulp Paper Ind.* 8, No. 4: 8 (April, 1934).

Waste Sulphite Liquor

A number of papers on waste sulphite liquor have appeared from the laboratories of the University of Washington at Seattle. In two general papers, Benson gives a review of the research work being carried out there. In the first *(149)* he reviews the laboratory fermentation experiments and plasticizing experiments with sulphite waste liquor. In the second paper *(150)* he reviews the work carried out in the state of Washington, with special reference to the pollution of seawater by sulphite waste liquor and describes an attempt to utilize the waste for industrial commodities and particularly for use as a road binder.

A survey of the analytical methods for the determination of the substances present in sulphite waste liquor are reviewed by Partansky and Benson *(151)* and from these they evolve a concise systematic method of analysis of sulphite waste liquor, including the following individual determination: (1) total solid, (2) residue on ignition, (3) calcium, (4) sulphur, (5) organic matter, (6) volatile acids, (7) minor volatile constituents such as methanol, ethanol, and acetone, (8) furfural, (9) pentoses, (10) lignin and lignin from methoxyl determinations and (11) sugar. Pollock and Partansky *(152)* describe a simple and inexpensive potassium permanganate method for the oxidation of sulphur to sulphate for analytical purposes. The determination of combustible sulphur in sulphite waste liquor is described by Kobe and Centenero *(153)*. The glass electrode is used for measuring the *p*H of sulphite waste liquor by Leitz, Sivertz, and Kobe *(154)*. This gives excellent results with sulphite waste liquor. They state that a *p*H of 9.6 is optimum for the precipitation of organic matter with ammonia.

(149) Benson, H. K., *Pac. Pulp Paper Ind.* 10, No. 11: 22-25 (Nov., 1936).
(150) Benson, H. K., *Pac. Pulp Paper Ind.* 11, No. 8: 61, 63, 65, 67 (Aug., 1937).
(151) Partansky, A. M., and Benson, H. K., *Paper Trade J.* 102, No. 7: 29-35 (Feb. 13, 1936).
(152) Pollock, R. N., and Partansky, A. M., *Ind. Eng. Chem., Anal. Ed.* 6, No. 5: 330-31 (Sept., 1934).

In an article by Benson and Partansky *(155)* the findings and conclusions of 2.5 years of laboratory study on the fermentations of sulphite liquor are summarized. Its pollution effect they find to be due chiefly to the sugars. The latter, together with the minor constituents, can be destroyed by gasification by the anaerobic methane type of fermentation, which is, however, relatively slow and cannot yet be controlled. The sugars can also be changed into butyric acid by a pure culture fermentation and the acid recovered. In both cases the residue contains only lignin and its 10 days' biochemical oxygen demand is only about 20 per cent that of the original liquor. Therefore, when lignin is first removed from the waste liquor, the methods of disposal are greatly simplified. All organic matter of sulphite waste liquor, including lignin, when sufficiently diluted is oxidized biochemically to carbon dioxide and water in both fresh and seawater, and the oxidation should be complete in about 5 months. They present evidence to show that the fear of pollution by sulphite waste liquor has been greatly exaggerated and that sufficient dilution accomplished by discharging into large bodies of water should solve the problem. O'Dell and Greenlaw *(156)* present data which show that under properly controlled conditions, ponding and aeration will greatly reduce the biological oxygen demand of sulphite waste liquor. Such a reduction would accordingly diminish the demand of this waste for the oxygen of the steam and thereby eliminate part of its pollutional effect. Aeration is considered a simple and feasible treatment for sulphite waste liquor.

(153) Kobe, K. A., and Centenero, A. D., *Paper Trade J.* 101, No. 24: 36 (Dec. 12, 1935).
(154) Leitz, C. F., Sivertz, V., and Kobe, K. A., *Pac. Pulp Paper Ind.* 9, No. 6: 10-13 (June, 1935).
(155) Benson, H. K., and Partansky, A. M., *Ind. Eng. Chem.* 28, No. 6: 738-40 (June, 1936).

Phillips, Goss, Brown, and Reid *(157)* suggest the ammoniation of waste sulphite liquor and its possible utilization as a fertilizer material. They treat the dry residues of the waste liquor with ammonia at high temperatures and obtain a material containing 10.5 per cent nitrogen, only a slight percentage of which is ammoniacal nitrogen. They find the product has some fertilizer value, although it is not equal to either dried blood or to a mixture of sodium nitrate and ammonium sulphate as a nitrogen source in mixed fertilizer. In a later paper, the same authors *(158)* describe the ammoniation of the neutralized dry residue of waste sulphite liquor at 220° C. with aqueous ammonia under pressure, producing a substance which contains 10.55 per cent nitrogen. Kobe, Layman, and Armbruster *(159)* first make the sulphite waste liquor alkaline with lime to a *p*H of 9.6 and precipitate the free and combined sulphur dioxide as calcium sulphite, then ammoniate directly the resulting liquor to give a solid and a liquid portion, both of which contain combined nitrogen. The solid material is perfectly suitable for fertilizer.

(156) O'Dell, M. J., and Greenlaw, A. Z., *Paper Trade J.* 99, No. 8: 41-2 (Aug. 23, 1934).
(157) Phillips, M., Goss, M. J., Brown, B. E., and Reid, T. R., *J. Wash. Acad. Sci.* 24, No. 1: 1-5 (January 15, 1934).
(158) Phillips, M., Goss, M. J., Brown, B. E., and Reid, T. R., *J. Agr. Research* 53, No. 3: 209-24 (August 1, 1936).

Phillips *(160)* gives the results of a study on the dry distillation of the residue of the waste sulphite liquor and compares the materials recovered with the products obtained in the dry distillation of alkali lignin. The most striking difference is the very small yield, 2 per cent of oil in the residue from waste sul-

phite liquor, as compared to the 28.3 per cent recovery obtained from alkali lignin. In the aqueous distillates, however, the relation is reversed, there being 30.0 per cent from sulphite waste liquor and 11.7 per cent from alkali lignin.

Billington, Chidester, and Curran *(161)* consider the recovery of soda base sulphite pulping liquor and describe a method of treatment with sodium bicarbonate which converts sodium sulphide to sodium carbonate; the sodium sulphite present in the ash was obtained from burning waste soda-sulphite liquor.

(159) Kobe, K. A., Layman, J. H., and Armbruster, F. R., *Ind. Eng. Chem.* 28, No. 5: 571-72 (May, 1936).
(160) Phillips, M., *Ind. Eng. Chem.* 25, No. 9: 991-93 (September, 1933).
(161) Billington, P. S., Chidester, G. H., and Curran, C. E., *Paper Trade J.* 101, No. 12: 44-46 (September 12, 1935).

A number of general papers have appeared on the utilization of sulphite waste liquor. An anonymous one *(162)* tells how the Inland Empire Paper Company has solved their problem by using the liquor to lay dust on gravel roads and to make and preserve a hard surface on such roads. The liquor, without any change as it comes from the plant, is stored in wooden tanks, delivered in trucks to the job, and applied just after a soaking rain. A highway treated in this manner is claimed to be superior to an oiled highway. The waste liquor as a spreader for fruit tree sprays is also suggested. The processing of waste liquor at the Marathon Paper Mills is described in two articles. Howard *(163)* points out that the main process is designed to afford an economical means of treating these liquors so as to avoid the objections raised concerning discharge into streams, and to recover products for use at the pulp mill in making fresh cooking acids and as a boiler fuel. The supplementary processes are for making special products to be used in agriculture and many other industries. An anonymous article *(164)* describes the first complete plant for processing waste sulphite liquor, whereby the waste liquor from the blow-pits is treated by the Howard process, a precipitation involving treatment with lime. This yields a lime-sulphur compound for use in making fresh cooking acids, a lignin product for use as a fuel or for further processing into various lignin products,

(162) *Pac. Pulp Paper Ind.* 8, No. 8: 14 (Aug., 1934).
(163) Howard, G. C., *Ind. Eng. Chem.* 26, No. 6: 614-17 (June 19, 1934).
(164) *Paper Trade J.* 102, No. 4: 13 (Jan. 23, 1936).

and a process effluent for discharging into the river without danger of pollution. The process is covered by patents. Certain phases of it will be licensed to other mills. Wells *(165)* describes the Paulson process for evaporating and burning sulphite waste liquor. Recent refinements in this process include the introduction of indirect heating of the liquor and the use of screw presses to remove liquor from the pulp in the blow-pit. Finally, C. J. West has compiled a bibliography of recent domestic and foreign patents on the utilization of waste liquors and waste gases of the pulp industry for the period of 1931 to 1935. These are arranged according to countries, with an author and a subject index *(166-172)*.

(165) Wells, S. D., *Paper Trade J.* 101, No. 19: 40-42 (Nov. 7, 1935).
(166) West, C. J., *Paper Trade J.* 101, No. 22: 43-48 (Nov. 28, 1935).
(167) West, C. J., *Paper Trade J.* 101, No. 24: 37-40 (Dec. 12, 1935).
(168) West, C. J., *Paper Trade J.* 101, No. 25: 46-49 (Dec. 19, 1935).
(169) West, C. J., *Paper Trade J.* 101, No. 26: 35-38 (Dec. 26, 1935).
(170) West, C. J., *Paper Trade J.* 102, No. 1: 39-44 (Jan. 2, 1936).
(171) West, C. J., *Paper Trade J.* 102, No. 2: 42-44 (Jan. 9. 1936).
(172) West, C. J., *Paper Trade J.* 102, No. 3: 31-35 (Jan. 16, 1936).

(to be continued)

Color Council Papers Published

The series of papers on the General Electric Recording Spectrophotometer, presented at the February 1938 Annual Meeting of the Inter-Society Color Council, of which TAPPI is a member, has just been published in the October number of the Journal of the Optical Society of America. Members of TAPPI desiring these papers may secure copies of the October issue of this Journal at 60 cents each from the American Institute of Physics, 175 Fifth Avenue, New York, N. Y.

The titles of the papers published in the above Journal are as follows:

"History of the Design of the Recording Spectrophotometer", by Arthur C. Hardy. "Construction of the General Electric Recording Spectrophotometer", by J. L. Michaelson. "Calibration and Operation of the General Electric Recording Spectrophotometer of the National Bureau of Standards", by Kasson S. Gibson and Harry J. Keegan. "Application of Spectrophotometric Data in the Printing Ink Industry", by Carl E. Foss. "Designation of Filters for Theatrical Lighting", by Deane B. Judd.

To Hold Fuel Conference Dec. 14

KALAMAZOO, Mich., November 18, 1938—The fuel engineering conference, announced earlier this month as being scheduled for December 14, will be held here in the Hotel Columbia during the afternoon and evening of December 13—that is, a day sooner than originally planned, according to word received today from J. E. Tobey, manager, fuel engineering division, Appalachian Coals, Inc., Cincinnati, Ohio.

"Various Michigan organizations and interests which requested this conference and outlined the type of program desired," Tobey advises, "learned that the December 14 date conflicted with another meeting in the state; therefore, we contacted our speakers and found them all willing to appear on Tuesday, December 13. We believe engineers of the Kalamazoo valley region will find it just as convenient to attend on that date as on the one originally announced."

This meeting will be the twenty-fourth in a series of educational conferences on coal burning and the third to be held in Michigan.

Crane Research Laboratories

The work of the company's research laboratories is described in a 47-page booklet just issued by the Crane Company, 836 South Michigan avenue, Chicago, Ill. As Charles B. Nolte, president, states in the foreword, "Crane Company is dedicated to the philosophy that only through continuing a well organized program of research can it best serve its employees, its stockholders, the users of its products, and society in general."

Crane Company regularly manufactures 45 nonferrous and 12 ferrous alloys. The publication describes the modern laboratory equipment and how much of it is used in making the many important scientific tests which enter into the development and perfectment of the company's well known line of piping materials. A number of special valve and fitting castings are made in the 18-8 type of stainless steel, heat treated to improve corrosion resistance.

Michigan Superintendents Meet

KALAMAZOO, Mich., November 18, 1938—The November meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Association was held on Thursday evening, of last week, at the Park American Hotel with forty-one present.

Chairman Ray L. Barton presided, and following the dinner he welcomed the members and guests. The announcement of his committees for the year were made as follows:

Programs—L. H. LaLiberte, O. W. Callighan, Glen Sutton, A. W. Cole, H. E. Stafford.

Attendance and Tickets—Arnold Weller, Otto Fischer, R. W. Holden, Al Sherwood, Lawrence Lynd.

Publicity—A. L. Perlick, R. L. Zellers, James Wise, N. J. Cowie.

Membership—C. "Baldy" Smith, R. B. Stewart, Jacob Parent.

Golf—F. B. Eilers, W. B. Hadley, L. E. Griffith.

Educational—E. G. Milham, Dan Stacy.

Finance—A. W. Cole, Jas. Wise.

Secretary-Treasurer, Al Perlick, read the financial report which showed the division to be in an enviable position. The joint meeting of the Superintendents Association and TAPPI was announced for January with D. C. Everest the principal speaker.

The speaker for the evening was P. S. Farquar of Niles, Mich., vice-president of the Michigan Bankers' Association, his subject being "Banking and its Relation to Business." He took the members behind the scenes and gave a very interesting address on the inner workings of a bank, which no doubt gave his hearers a new slant on this important and complicated business.

The forum following his address was instructive and well blended with humor.

G. A. Petersen of the Rice-Barton & Fales Company read a paper, on "Improvements on Paper-Making Machinery," followed by a film furnished by the same company, showing the operation of the McDonnell fourdrinier, manufactured by them. The paper by Mr. Petersen and the film held the attention of the meeting and judged by the number of questions offered in the forum, had created considerable interest.

Among those present were: Ray Olson, O. F. Fischer, R. H. Smith, of Bryant Paper Company. A. L. Sherwood, Glen Sutton, and Arnold Weller, of the Sutherland Paper Company. Arthur Cole, Heinie Nendorf, and H. C. Bradford, of Rex Paper Company. Harris O. Ware, L. E. Fitzgerald, F. L. Chappell, and R. R. Buss of the Hercules Powder Company. L. F. Kretchman. Geo. S. McElroy and G. E. Petersen, of the Rice-Barton & Fales Company. M. S. Fogerty, Geo. C. Schmid, W. H. Astle, C. A. Bragenton, Ray L. Barton and Paul deGuehery, of the Michigan Paper Company. E. G. Milham, of Watervliet Paper Company. Joe Shuman, Atturbury Brothers. Howard Mayshaw, Bird Machine Company. R. W. Holden, Stowe, Woodward Company. G. T. Ingling, J. Boodt, and James Wise of the Kalamazoo Paper Company. G. A. Fagerstin, Detroit Paper Products Corporation. W. A. Geiger, Weyerhaeuser Company. G. Lagerloef, Lagerloef Trading Company. Norman J. Cowie and John Tooker, Hawthorne Paper Company. O. W. Callighan, Edgar Brothers Company. B. M. Baxter, Bevis Machine Company. T. H. Latimer, Black-Clawson Company. A. L. Perlick, Kalamazoo Vegetable Parchment. P. S. Farquar, Niles, Mich., vice-president of Michigan Bankers' Association. F. L. Zellers, National President Superintendents Association. Robert Zellers, Niles, Mich. H. O. Parker, French Paper Company. C. E. Van Buren, Albany Felt Company.

Government Paper Bids

WASHINGTON, D. C., November 23, 1938—The Government Printing Office has received the following bids for 35,190 pounds (100,000 sheets) of 100 per cent rag, white chart paper: Walker, Goulard Plehn Company, 23 cents; Old Dominion Paper Company, 18.464 cents; Lee Paper Company, 19.37 cents; Mathers-Lamm Paper Company, 18.38 cents; R. P. Andrews Paper Company, 17.56 cents; Mudge Paper Company, 17.48 cents; and Barton, Duer & Koch Paper Company, 17.3 cents.

For 11,850 pounds (125,400 sheets) of 25 per cent rag, 34 x 40 inches blue bond paper: Aetna Paper Company, 10.23 cents; Barton, Duer & Koch Paper Company, 9.98 cents; R. P. Andrews Paper Company, 11.95 cents; Stanford Paper Company, 11.33 cents; Whitaker Paper Company, 11.5 cents; Mudge Paper Company, 11.34 cents; Paper Corp. of U. S., 10.48 cents.

For 5,000 pounds (108,000 sheets) of 28 x 34 inches yellow sulphite manifold paper: Whitaker Paper Company, 7.997 cents; Old Dominion Paper Company, 9.74 cents; Barton, Duer & Koch Paper Company, 7.99 cents; Import Paper Company, 7.85 cents; Paper Corp. of U. S., 7.85 cents; Mudge Paper Company, 7.97 cents; R. P. Andrews Paper Company, 8 cents; and Walker, Goulard Plehn Company, 8.05 cents.

Paper & Twine Club Meets

BOSTON, Mass., November 21, 1938 — The first annual dinner of the New England Chapter of the Paper and Twine Club, Boston, was held Tuesday evening at the Boston Chamber of Commerce, with about 30 present. Frank Vaughn, of the Bay West Paper Company, Green Bay, Wis., the national president of the Paper and Twine Club, explained the new plan which the club is sponsoring for the merchant salesmen. John L. Richey, national secretary, treasurer and counsel, Cincinnati, Ohio, discussed the Public Relations Plan, which the club has also sponsored. Charles Walden, Jr., president and general manager of *Paper and Paper Products*, New York, spoke on the history of the Club. The club now numbers about 575 in the United States. Officers of the New England Chapter are: Chairman, Lennox Ransom, Union Bag and Paper Corporation; vice-chairman, Charles A. Shaw, Whitney Bros., Inc., both of Boston.

D. P. Rhoades Goes with Mohawk Mills

David P. Rhoades, formerly with the Waterfalls Paper Company has joined the sales organization of the Mohawk Paper Mills, Inc., Cohoes, N. Y., and will make his headquarters at the New York sales office of the company.

The SKF Triple Seal

A patented triple seal which effectively protects the bearing against lubricant leakage, dust, dirt, and moisture has been made available by SKF Industries, Inc., Front street and Erie avenue, Philadelphia.

This seal consists of two split piston rings on each side of the housing and grooved on the outside diameter to form a labyrinth seal with the two end bores of the housing. Each ring has an inward tension that enables it to turn with the shaft.

On either side of the housing, two rings are mounted on the shaft with the splits 180 degrees apart to prevent lubricant leakage through the splits. The inner ring serves as an internal flinger, and the outer ring keeps dirt and other foreign substance from entering the housing.

Because these rings are not securely fastened to the shaft, the seals are free to locate themselves axially whenever shaft expansion occurs. Consequently, close clearances are maintained at all times between the rings and the housing.

Made of cast iron, the rings are hammered on the outside diameter in order to obtain the required inward tension to hold them properly on the shaft. If any lubricant should pass the first seal, it is returned into the housing through a hole located in the center groove of the bottom half of the housing. The lubricant is returned at a point below the oil level.

The triple seal is made for the complete range of standard shaft sizes, and is designed for split housings which are machined to allow axial freedom of the bearing. These housings are sturdy and designed to accommodate various shaft diameters which are necessary to compensate for the various types of bearings having the same outside diameter.

Another unique advantage is that when a bearing is to be stabilized, the same housing is used as for the floating bearing. The stabilizing is effected by one or two rings depending on the width of the particular bearing used. A segment of the ring is removed so that it can be slipped over the shaft and applied between the outer race of the bearing and the housing shoulder. This avoids the necessity of supplying two different housings and enables the user to stabilize or float any one of the bearings in any application.

To Erect Paper Mill In India

WASHINGTON, D. C., November 23, 1938—The Government of Hyderabad, Deccan, British India, has sanctioned a scheme for the establishing of a pulp and paper mill with a capacity of about 6,000 long tons per annum. It is to be located at Sirpur, where, it is said, good quality bamboo and coal are available within easy reach. The Hyderabad Construction Co., Ltd., Hyderabad, Deccan, is the managing agent of this mill.

Issue Carico Vellum Folder

BOSTON, Mass., October 24, 1938—Carter, Rice & Co., Corp., are now offering the trade a file folder containing samples of their various sheets, cards and envelopes that are sold under the name of Carico Vellum Announcements. Prices for the entire line are printed on a sheet pasted in the middle. Business cards are also placed upon a smaller folder, with prices of the entire line given on the last page of Carter Rice Business Card Announcement.

New Westinghouse Catalog

A ribbon of paper 11,000,000 feet long and five feet wide has begun whirring through the presses to form 82,000 copies of the new 1939-40 General Catalog listing some 100,000 styles and sizes of products of the Westinghouse Electric & Manufacturing Company. On its pages is written the story of electric power, from generators to washing machines and toasters, from titanic steel mill motors to tiny one-twentieth horsepower motors to drive electric shavers. Edited at the East Pittsburgh Westinghouse works, the new catalog will have provided more than 26,000 man-hours of work.

If piled on top of one another, the completed catalogs would make a paper tower rising three and a quarter miles into the sky, but even their combined mass of 646,406 pounds of paper does not tell all the story of Westinghouse production, as many renewal parts are not listed.

More than 16,000 yards of book cloth were required to bind the fifteen carloads of paper and each catalog will contain 3,700 photographs. The printed words will consume 4,300 pounds of ink, 17,864 pounds of type metal and 5,544 pounds of nickeltypes.

A special copy of the catalog was included among the exhibits of this age deposited within the Time Capsule at the New York World's Fair grounds, recently, to await discovery by archaeologists 5,000 years from now.

New Line of Saco Speed Reducers

The Stephens-Adamson Manufacturing Company, Aurora, Ill., has added to its well known line of J. F. S. variable speed reducers, a new line of constant speed reducers to be advertised and sold under the trade name. Saco.

Saco speed reducers can be used with any standard, full speed motor to give required output speed. The motor support is adjustable for V-belt drive, permitting sheaves to be replaced with ease to suit changes in required output speed. The shaft support construction of the Saco Speed Reducer permits heavy over-hung load. The wide range of output speed varies from 13.2 rpm. to 172 rpm. The high efficiency of Saco Reducers runs from 89 to 93 per cent.

All shafts are mounted in precision ball bearings and the precision cut helical steel gears operate in a constant bath of oil.

Application of the new Saco Reducers is literally universal. While Stephens-Adamson features these new reducers with their Redler conveyor-elevators, belt conveyors, feeders, elevators and screw conveyors, they can be used with any constant speed driven machine within the Saco output speed range.

Bulletin 7638 will be sent to interested parties upon request.

Buys Amhemco Pulp Mill Machinery

Mansel L. Rankin, dealer in used paper and pulp mill machinery, Sandusky, Ohio, has purchased most of the pulp mill equipment at the pulp mill formerly operated by the Amhemco Corporation, Danville, Ill.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING NOVEMBER 19, 1938

SUMMARY

Cigarette paper .....787 cs.
Wall paper .....2 bls., 25 cs.
Paper hangings .....6 bls., 2 cs.
Newsprint .....
Printing paper .....242 rolls, 66 bls., 148 cs.
Wrapping paper .....3,543 rolls, 132 bls., 1 cs.
Packing paper .....9 cs.
Drawing paper .....6 cs.
Filter paper .....15 cs.
Surface coated paper .....23 cs.
Surface baryta coated paper .....83 crates
Photo paper .....4 cs.
Basic paper .....15 cs.
Tissue paper .....44 cs.
Colored paper .....6 cs.
Miscellaneous paper .....18 bls., 30 cs.

CIGARETTE PAPER

Champagne Paper Corp., *Ile de France,* Havre, 761 cs.
De Mauduit Paper Corp., *Ile de France,* Havre, 1 cs.
Braunstein Freres, Inc., *Ile de France,* Havre, 25 cs.

WALL PAPER

Titan Shipping Co., *Oslofjord,* Oslo, 9 cs.
Thomas & Pierson, *American Farmer,* London, 1 cs.
——, *Ile de France,* Havre, 14 cs.
——, *Hansa,* Bremen, 2 bls., 1 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Farmer,* London, 6 bls., 2 cs.

NEWSPRINT

Jay Madden Corp., *Pr. Harding,* Finland, 526 rolls.
N. Y. Evening Journal, *Pr. Harding,* Finland, 248 rolls.
Daily Mirror, *Snar,* Quebec, 1151 rolls.
N. Y. Evening Journal, *Snar,* Quebec, 3199 rolls.
N. Y. Evening Journal, *Markland,* Liverpool, N. S., 566 rolls.
N. Y. Tribune, *Markland,* Liverpool, N. S., 1524 rolls.
World Telegram, *Markland,* Liverpool, N. S., 600 rolls.
Brooklyn Daily Eagle, *Markland,* Liverpool, N. S., 532 rolls.
Herald Statesman, Inc., *Markland,* Liverpool, N. S., 42 rolls.
Gilman Paper Co., *Markland,* Liverpool, N. S., 376 rolls.
N. Y. Post, *Markland,* Liverpool, N. S., 829 rolls.
International Purchasing Co., *International No. 1,* Gatineau, 323 rolls.
H. G. Craig Co., Inc., *Newscarrier,* Donnacona, 313 rolls.
H. G. Craig Co., Inc., *Donpaco,* Donnacona, 375 rolls.
News Syndicate Co., *Louisianan,* Comeau Bay, 6268 rolls.
H. G. Craig Co., Inc., *A. C. D.,* Donnacona, 347 rolls.
Gilman Paper Co., *Vasaholm,* Norrkoping, 381 rolls.
Brooklyn Daily Eagle, *Vasaholm,* Norrkoping, 71 rolls.
——, *Vasaholm,* Norrkoping, 77 rolls.
Jay Madden Corp., *Mormacsun,* Kotka, 171 bls., 729 rolls.
Dunham & Reeve, Inc., *Mormacsun,* Kotka, 238 rolls.
H. Reeve Angel & Co., Inc., *Mormacsun,* Kotka, 72 rolls.
Perkins Goodwin & Co., *Hansa,* Hamburg, 156 rolls.
Jay Madden Corp., *Hansa,* Finland, 249 rolls.

PRINTING PAPER

Irving Trust Co., *Oslofjord,* Oslo, 111 rolls.
Dingelstedt & Co., *Bremen,* Bremen, 30 cs.
R. J. Saunders, *Ile de France,* Southampton, 3 cs.
E. Dietzgen & Co., *Hansa,* Hamburg, 64 cs.
Dingelstedt & Co., *Hansa,* Bremen, 31 rolls, 51 cs.
Jay Madden Corp., *Pr. Harding,* Finland, 100 rolls, 66 bls.

WRAPPING PAPER

Titan Shipping Co., *American Farmer,* London, 1 cs.
L. Glickman & Co., *Pr. Harding,* Finland, 132 bls., 337 rolls.
Jay Madden Corp., *Pr. Harding,* Finland, 2503 rolls, 703 bls.

PACKING PAPER

Phoenix Shipping Co., *Hansa,* Bremen, 9 cs.

DRAWING PAPER

Keuffel & Esser Co., *American Farmer,* London, 2 cs.
H. Reeve Angel & Co., Inc., *American Farmer,* London 4 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., *American Farmer,* London, 2 cs.
——, *Hansa,* Hamburg, 13 cs.

SURFACE COATED PAPER

Gevaert Co., of America, *Black Gull,* Antwerp, 20 cs.
Globe Shipping Co., *Hansa,* Hamburg, 3 cs.

SURFACE BARYTA COATED PAPER

Globe Shipping Co., *Hansa,* Bremen, 83 crates.

PHOTO PAPER

Medo Photo-Supply Co., *American Farmer,* London, 2 cs.
Freedman & Slater, *Hansa,* Hamburg, 2 cs.

BASIC PAPER

Dingelstedt & Co., *Hansa,* Bremen, 15 cs.

TISSUE PAPER

Y. Yabuki Co., *Kunikawa Maru,* Kobe, 4 cs.
D. F. Young, Inc., *Laconia,* Liverpool, 4 cs.
Tricolator Co., *Kosin Maru,* Kobe, 6 cs.
Remington Rand, Inc., *Kosin Maru,* Kobe, 22 cs.
Dingelstedt & Co., *American Traveler,* Liverpool, 8 cs.

COLORED PAPER

D. C. Andrews & Co., *Bremen,* Bremen, 2 cs.
J. W. Tampton, Jr. & Co., *Black Gull,* Antwerp, 3 cs.
D. C. Andrews & Co., *Hansa,* Bremen, 1 cs.

MISCELLANEOUS PAPER

Remington Rand, Inc., *Kosin Maru,* Kobe, 10 cs.
Winsor & Newton, Inc., *American Farmer,* London, 8 cs.
American Express Co., *Ile de France,* Havre, 18 bls., 6 cs.
H. W. Robinson Co., *Ile de France,* Havre, 5 cs.
Keuffel & Esser Co., *Hansa,* Hamburg, 1 cs.

RAGS, BAGGINGS, ETC.

Delia Waste Products Corp., *Kunikawa Maru,* Kobe, 50 bls. rags.
——, *Laconia,* Liverpool, 13 bls. rags.
Jaffe Products Co., *Siboney,* Havana, 38 bls. rags.
Atlas Waste Manfg. Co., *Siboney,* Havana, 14 bls. cotton sweepings.
E. J. Keller Co., Inc., *Cold Harbor,* ——, 42 bls. rags.
Chase National Bank, *Cold Harbor,* Manchester, 119 bls. bagging.
Philadelphia National Bank, *Cold Harbor,* Liverpool, 32 bls. bagging.
G. W. Millar & Co., Inc., *Cold Harbor,* Dublin, 97 bls. waste paper.
Darmstadt Scott & Courtney, *Indep. Hall,* Havre, 167 bls. bagging.
Chase National Bank, *Indep. Hall,* Dunkirk, 54 bls. jute waste.
——, *American Traveler,* Manchester, 48 bls. rags, 72 bls. old twines.
National City Bank, *American Traveler,* Manchester, 61 bls. waste strings.
Chase National Bank, *American Traveler,* Manchester, 43 bls. paper stock.
Leigh Textile Co., *American Traveler,* Manchester, 43 bls. bagging.
——, *American Traveler,* Liverpool, 6 bls. rags.
Darmstadt Scott & Courtney, *Hedrun,* Gdynia, 194 bls. bagging.
E. Butterworth & Co., Inc., *Tonsbergfjord,* Antwerp, 91 bls. jute waste.
Irving Trust Co., *Tonsbergfjord,* Antwerp, 118 bls. bagging.
Darmstadt Scott & Courtney, *Tonsbergfjord,* Antwerp, 98 bls. bagging.

———, *Tonsbergfjord,* London, 27 bls. waste paper.
E. J. Keller Co., Inc., *Black Gull,* ———, 61 bls. bagging.
Continental Bank Trust Co., *Black Gull,* Antwerp, 4 bls. rags.
Hughes Fawcett, Inc., *Ilsenstein,* Antwerp, 14 bls. flax waste.
E. J. Keller Co., Inc., *Excalibur,* ———, 170 bls. paper stock.
Loumar Textile By-Products, Inc., *Pr. Harding,* Hamburg, 23 bls. bagging.

HIDE CUTTINGS

———, *American Traveler,* Liverpool, 266 bags.

OLD ROPE

W. Steck & Co., *Cypria,* Marseilles, 82 rolls.
Chase National Bank, *Cold Harbor,* Liverpool, 131 coils.
Banco Coml. Italiane Trust Co., *Cold Harbor,* Glasgow, 57 coils.
Chase National Bank, *American Farmer,* London, 92 coils.
W. Steck & Co., *Volendam,* Rotterdam, 47 coils.
Banco Coml. Italiane Trust Co., *Tonsbergfjord,* London, 149 bls.
W. Steck & Co., *Tonsbergfjord,* London, 139 bls.
Chase National Bank, *Montreal City,* Bristol, 111 coils.
———, *Montreal City,* Bristol, 93 coils.
W. Steck & Co., *Express,* Marseilles, 44 bls., 59 rolls.

CHINA CLAY

English China Clays Sales Corp., *Laconia,* Liverpool, 244 bags.
———, *Laconia, Liverpool,* 125 casks.
American Cyanamid & Chemical Corp., *Volendam,* Rotterdam, 200 bags.

WOOD PULP

Bankers Trust Co., *Livenza,* Trieste, 565 bls. wood pulp.
Chase National Bank, *Oslofjord,* Oslo, 590 bls. sulphite.
Irving Trust Co., *Oslofjord,* Oslo, 900 bls. chemical pulp.
Johaneson Wales & Sparre, Inc., *Hedrun,* Gdynia, 1050 bls. wood pulp, 105 tons.
Stora Kopparberg Corp., *Vasaholm,* Gefle, 530 bls. dry pulp.
Pagel Horton & Co., Inc., *Vasaholm,* Gefle, 250 bls. sulphate, 1675 bls. sulphite.
Pulp Sales Corp., *Mormacsun,* Helsingfors, 1670 bls. sulphite, 282 tons.
Pulp Sales Corp., *Mormacsun,* Wiborg, 135 bls. sulphate, 27 tons.
J. Andersen & Co., *Gripsholm,* Gothenburg, 625 bls. sulphite.
Bank of N. Y. Trust Co., *Hansa,* Hamburg, 135 bls. wood pulp, 27 tons.
Castle & Overton, Inc., *Hansa,* Hamburg, 800 bls. wood pulp, 160 tons.
Gottesman & Co., Inc., *Gonzenheim,* Sweden, 7860 bls. wood pulp.

WOOD PULP BOARDS

Jay Madden Corp., *Mormacsun,* Wiborg, 113 bls., 12 tons.
Jay Madden Corp., *Mormacsun,* Kotka, 82 rolls, 25 tons.
H. Fuchs & Son, *Gripsholm,* Gothenburg, 22 crates.

ALBANY IMPORTS

WEEK ENDING NOVEMBER 19, 1938

Pagel Horton & Co., Inc., *Gonzenheim,* Sweden, 10,000 bls. wood pulp.

PORTLAND IMPORTS

WEEK ENDING NOVEMBER 19, 1938

Pagel Horton & Co., Inc., *Alsund,* Sweden, 4105 bls. wood pulp.
Gottesman & Co., Inc., *Alsund,* Sweden, 2700 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING NOVEMBER 19, 1938

Price & Pierce, Ltd., *Gonzenheim,* ———, 3300 bls. unbleached sulphite, 1710 bls. unbleached sulphate, 360 bls. bleached sulphite.
Gottesman & Co., Inc., *Gonzenheim,* Sweden, 750 bls. wood pulp.
Pagel Horton & Co., Inc., *Gonzenheim,* Sweden, 1325 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 19, 1938

Bankers Trust Co., *Livenza,* Trieste, 308 bls. wood pulp.
Castle & Overton, Inc., *Indep. Hall,* Havre, 191 bls. rags.
National Vulcanized Fibre Co., *Indep. Hall,* Havre, 113 bls. rags.
The Lang Co., *Indep. Hall,* Havre, 283 bls. rags.
Union Waste Co., Inc., *Indep. Hall,* Dunkirk, 50 bls. old rope.
E. J. Keller Co., Inc., *Indep. Hall,* ———, 169 bls. rags, 43 bls. bagging.
Perkins Goodwin & Co., *Hedrun,* Gdynia, 1940 bls. wood pulp, 300 tons.
E. J. Keller Co., Inc., *Noordam,* ———, 42 bls. bagging.
Darmstadt Scott & Courteney, *Exmoor,* Casablanca, 300 bls. rags.
E. J. Keller Co., Inc., *Robert Maersk,* ———, 97 bls. bagging.
Gottesman & Co., Inc., *Mormacsun,* Stockholm, 2500 bls. sulphite, 254 tons.
Pulp Sales Corp., *Mormacsun,* Wiborg, 2540 bls. sulphite, 472 tons.
Jay Madden Corp., *Mormacsun,* Kotka, 221 rolls wood pulp boards, 42 tons.
J. W. Hampton Jr. & Co., *Mormacsun,* Kotka, 90 rolls newsprint.
Public Ledger, Inc., *Mormacsun,* Kotka, 345 rolls newsprint.
E. J. Keller Co., Inc., *Tonsbergfjord,* ———, 259 bls. bagging.
Gottesman & Co., Inc., *Kexholm,* Sweden, 2950 bls. wood pulp.
Gottesman & Co., Inc., *Svanehild,* Sweden, 4060 bls. wood pulp.

WILMINGTON IMPORTS

WEEK ENDING NOVEMBER 19, 1938

Bulkley Dunton Pulp Co., Inc., *Mormacsun,* ———, 600 bls. sulphite, 101 tons.
Castle & Overton, Inc., *Mormacsun,* Wiborg, 2548 bls. wood pulp, 509 tons.
Pulp Sales Corp., *Mormacsun,* Wiborg, 1906 bls. sulphite, 381 tons.
Price & Pierce, Ltd., *Milos,* ———, 8400 bls. unbleached sulphite.

BALTIMORE IMPORTS

WEEK ENDING NOVEMBER 19, 1938

W. H. Masson, *Cold Harbor,* Dublin, 203 bls. waste paper.
Congoleum Nairn Co., *Indep. Hall,* Havre, 36 bls. rags.
Castle & Overton, Inc., *Black Gull,* Rotterdam, 325 bls. wood pulp, 65 tons.
Congoleum Nairn Co., *Express,* Marseilles, 259 bls. rags.
———, *Vasaholm,* Norrkoping, 1491 rolls newsprint.
Stora Kopparberg Corp., *Vasaholm,* Gefle, 6365 bls. dry pulp.
Pagel Horton & Co., Inc., *Vasaholm,* 1125 bls. sulphate, 5750 bls. sulphite.
Bulkley Dunton Pulp Co., Inc., *Vasaholm,* ———, 1075 bls. sulphite.
Gottesman & Co., Inc., *Vasaholm,* Iggesund, 2000 bls. sulphate.
Atterbury Bros., Inc., *Vasaholm,* Iggesund, 1500 bls. sulphite.
Perkins Goodwin & Co., *Vasaholm,* Sundsvall, 2850 bls. sulphate, 810 bls. sulphite.
———, *Vasaholm,* Sundsvall, 280 bdls. wall board.
Gottesman & Co., Inc., *Kexholm,* Sweden, 3125 bls. wood pulp.
Gottesman & Co., Inc., *Svanhild,* Sweden, 600 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING NOVEMBER 19, 1938

———, *Livenza,* Trieste, 1003 bls. wood pulp.
National City Bank, *Cold Harbor,* Manchester, 103 bls. bagging.
National City Bank, *Cold Harbor,* Liverpool, 552 bdls. waste sacking.
Gottesman & Co., Inc., *Wanja,* Sweden, 5200 bls. wood pulp.

NEWPORT NEWS IMPORTS

WEEK ENDING NOVEMBER 19, 1938

Stora Kopparberg Corp., *Vasaholm,* Gefle, 930 bls. dry pulp.
———, *Vasaholm,* Gefle, 2944 bls. sulphite.
Gottesman & Co., Inc., *Vasaholm,* Iggesund, 375 bls. sulphite.
Bulkley Dunton Pulp Co., Inc., *Vasaholm,* Iggesund, 2500 bls. sulphate.
Gottesman & Co., Inc., *Svanhild,* Sweden, 2500 bls. wood pulp.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, November 23, 1938.

Reports from manufacturers' representatives, jobbers and wholesale paper merchants indicate that the gradual improvement in consumer demand for many grades of paper continues during the current week. The index of general business activity shows a small increase above the preceding week and now stands at 90.1 per cent. Production of paper, including 165 mills producing all grades of paper but only a small amount of newsprint, was 80.3 per cent for the week ended November 12. This compares with 61.7 per cent for the week ended November 13, 1937. Production of paper board was 66.0 per cent, compared with 57.0 for like periods.

The consumption of newsprint continues to gradually increase under the slow recovery of general business. The industry expects improvement to show in the final reports for the last quarter of this year, with better business expected during the first quarter of next year. Prices are firm.

Sales volume in some grades of sulphite papers is reported improved, including the more popular grades of sulphite bond papers. A note of encouragement comes from a number of wholesale paper merchants who report an improved demand for the medium and better grades of book papers widely used in letterpress printing.

Production and sales of kraft paper are reported to be well maintained. The demand for paper board is good and prices in general for all grades of paper and board are relatively firm.

Mechanical Pulp

A little improvement in the demand for mechanical pulp is reported this week. Prices remain unchanged on imported and domestic pulps.

Chemical Pulp

Consumption of chemical pulp is reported in some quarters of the trade as a little improved for the week. The announced price of domestic producers for prime bleached sulphite is $50 per ton for the first quarter of 1939. No change in prices of any grade of sulphite pulp is reported this week. With the price trend, particularly in kraft, downward at this date, lower prices on many grades of kraft pulp are reported this week. The current price range of bleached kraft is at from $2.25 to $2.75 per cwt., light and strong, at from $1.75 to $1.85; No. 1 kraft, at from $1.55 to $1.75; No. 2 kraft, at from $1.50 to $1.55; and domestic kraft is quoted at from $1.25 to $1.75 per cwt., f.o.b., pulp mill.

Old Rope and Bagging

Somewhat less demand is reported in old rope for this week. Prices hold steady and are unchanged, excepting on foreign manila rope which is now quoted at from $2.60 to $2.75. The old bagging market is rather quiet, with no important price changes reported.

Rags

No change in demand or prices is reported in new and old domestic rags this week, excepting small reductions on No. 1 and No. 2 roofing rags, which are now quoted: No. 1, 1.15 to 1.20; No. 2, .90 to 1.00. Prices hold firm. The foreign rag market continues inactive, with prices nominal.

Old Waste Paper

Prices of all grades of waste paper remain firm under a narrow demand. The only important change in prices reported this week is on white envelope cuttings, which are currently quoted at 2.50 to 2.60.

Twine

No change in demand or prices is reported in any grade of hard or soft fiber twine this week. Prices are relatively firm and no change from prevailing market quotations are expected in the trade in the near future.

Automatic Roll Wrapper

A complete automatic over-all toilet roll wrapper is one of the recent innovations of the Cannard Company, Green Bay, Wis., and is being used by the leading and most successful converting mills throughout the country. Up to the advent of this machine the wrapping process was the one step in production not made fully automatic. The machine, which handles 50 rolls per minute, requires only one operator who is also able to pack the rolls as they come from the machine.

Not only does it do its own work swiftly and accurately, but is ever on guard to break apart rolls not entirely separated by the slitters. Variations up to ½ inch in the diameters of the rolls are automatically taken care of, as are protruding cores, end rolls, etc. If a roll is not immediately presented for wrapping, the machine automatically stops and waits until the feeding device, which is in constant operation, delivers the next roll, which promptly starts the mechanism again. The production of 2, 3, or 4 rewinders is taken care of by one machine. This speed-up produces a substantial saving.

It is a comparatively small, compact machine, occupying approximately the space of the wrapping table which it displaces. Only a small table is needed to catch the rolls as they are discharged in an upright position ready for packing. With space at a premium, and profit dependent to such a large extent on efficiency and speed, a machine of this character should prove a welcome addition to the converting industry.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, November 23, 1938.

ALUM (Activated)—Quotations on activated alum remain firm and continue unchanged at prevailing prices. The commercial grades are quoted at $.90 per 100 pounds, in 100 pound multi-wall bags, carload quantities, f.o.b., works.

BLANC FIXE—Quotations on blanc fixe are firm and conform to prevailing market prices. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER — The prices of bleaching powder remain firm and conform to prevailing market levels. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein is reported as improved for this week and prices firm. Standard domestic casein, 20-30 mesh, is quoted at from 8½ to 9 cents per pound; 80-100 mesh at 9 cents per pound; all prices in bags, car lot quantities.

CAUSTIC SODA—Quotations on caustic soda are firm and conform to prevailing market prices. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums at works.

CHINA CLAY—Quotations on china clay continue firm and unchanged at prevailing market prices. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is quoted at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—Prices on chlorine continue firm and unchanged at prevailing levels. Chlorine is quoted at $2.15 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The demand for rosin continues fair for the week. "G" gum rosin is quoted at $5; "FF" wood rosin at $4.85 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is quoted at $2.75 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Prices on salt cake continue firm and prices conform to prevailing market levels. Quotations range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—Quotations on soda ash are firm and unchanged at prevailing market prices. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The demand for corn starch continues good and prices are firm. Globe pearl is quoted at $2.50 per 100 pounds, in bags. Special paper starch is quoted at $2.60, in bags; all prices in car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina remain firm and conform to prevailing prices. The commercial grades are quoted at $1.15; iron free at $1.30 per 100 pounds, in barrels, car lot quantities, f.o.b., works.

SULPHUR—The demand for sulphur continues good and prices remain firm at prevailing levels. Annual contracts are quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC — The prices of talc continue firm and unchanged at representative quoted market prices. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is quoted at from $25 to $40 per ton, on dock.

Market Quotations

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	@	—
Kraft—per cwt.—Delivered Zone A			
No. 1 Northern	$4.75	@	$5.25
Superstandard	4.12½	@	4.62½
Northern Standard Wrapping	4.00	@	—
Standard Wrapping	3.50	@	—
Tissues—Per Ream—Carlots			
White No. 1	.92½	@	—
White No. 1 M. G.	.90	@	—
White No. 1½	.67½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.60	@	—
Unbl. Toilet, 1 M.	3.20	@	—
Bleached Toilet	5.26	@	—
Paper Towels—			
Unbleached	1.80	@	—
Bleached	2.10	@	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	9.75
No. 2 Jute	7.50	@	9.00
No. 1 Manila Wrapping, 35 lb.	5.00	@	—
No. 2 Manila Wrapping, 35 lb.	4.75	@	—
Boards, per ton—			
News	27.50	@	30.00
Chip	27.50	@	30.00
Sgl. Mla. Ll. Chip	42.50	@	—
Jute Lined Chip	42.50	@	45.00
White Pat. Coated	55.00	@	57.50
Kraft Liners	42.50	@	50.00
Binders Boards	71.00	@	77.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	31.05@ 36.50	32.20@ 37.75
85% Rag	.....	29.90@ 35.00
75% Rag	23.60@ 27.75	24.75@ 29.00
65% Rag	.....	21.65@ 26.25
50% Rag	17.55@ 21.50	18.70@ 22.75
25% Rag	14.65@ 17.75	15.80@ 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$8.20@$10.00	$9.35@$11.50
No. 2	7.30@ 9.00	8.50@ 10.25
No. 4	6.45@ 7.75	7.60@ 9.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$10.80	@$12.50
No. 2 Glossy Coated	9.25	@ 10.75
No. 3 Glossy Coated	8.15	@ 9.50
No. 4 Glossy Coated	7.65	@ 9.00
No. 1 Antique (watermarked)	7.65	@ 9.00
No. 2 Offset	7.00	@ 8.25
A Grade E. F.	6.80	@ 8.00
A Grade S. & S. C.	7.05	@ 8.25
B Grade E. F.	6.25	@ 7.50
B Grade S. & S. C.	6.50	@ 7.75
C Grade E. F.	6.00	@ 7.00
C Grade S. & S. C.	6.25	@ 7.25
D Grade E. F.	5.70	@ 6.75
D Grade S. & S. C.	5.95	@ 7.00

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—		
Moist	25.00	@28.00
Dry	25.00	@28.00
(Delivered)		
No. 1 Domestic and Canadian	29.00	@33.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—		
Prime Bleached Sulphite	2.35	@ 2.75
Prime Qualities—		
Easy-Bleaching Sulphite	1.90	@ 2.10
Strong Unbleached Sulphite	1.80	@ 2.00
(On Dock, Atlantic Ports)		
Kraft Bleached	2.25	@ 2.75
Kraft Light & Strong	1.75	@ 1.85
Kraft No. 1	1.55	@ 1.75
Kraft No. 2	1.50	@ 1.55
(F. o. b. Pulp Mill)		
Kraft Domestic	1.25	@ 1.75
(Delivered)		
Soda Bleached	2.55	@ —

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1.	6.75	@ 7.00
Silesias No. 1	4.00	@ 4.25
New Unbleached	6.75	@ 7.00
Blue Overall	5.25	@ 5.50
Fancy	2.10	@ 2.25
Washables	1.60	@ 1.70
Mixed Khaki Cuttings	3.25	@ 3.75
O. D. Khaki Cuttings	4.00	4.25

Old Rags

White, No. 1—		
Repacked	3.15	@ 3.40
Miscellaneous	2.60	@ 2.75
White, No. 2—		
Repacked	1.90	@ 2.10
Miscellaneous	1.50	@ 1.60
Thirds and Blues—		
Repacked	1.40	@ 1.50
Miscellaneous	1.25	@ 1.30
Roofing Rags—		
No. 1	1.15	@ 1.20
No. 2	.90	@ 1.00
No. 3 (bagging)	.85	@ .90
No. 4	.65	@ .70
No. 5A	.65	@ .70

Foreign Rags

New Rags

New Dark Cuttings	2.25	@ 2.40
New Mixed Cuttings	2.00	@ 2.20
New Light Silesias	5.50	@ 5.75
Light Flannelettes	5.50	@ 5.75
New White Cuttings	7.00	@ 7.50
New Light Oxford	4.00	@ 4.50
New Light Prints	3.00	@ 3.25

Old Rags

No. 1 White Linens	7.50	@ 8.50
No. 2 White Linens	6.50	@ 7.50
No. 3 White Linens	4.50	@ —

J. Andersen & Co.

Selling Agents

21 East 40th Street

New York

CHEMICAL & MECHANICAL PULP

Kraft Pulp

BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
KALIX TRÄINDUSTRI AKTIEBOLAG
Vanoffärden, Sweden
MUNKSUNDS AKTIEBOLAG
Munksund, Sweden
NEMSJÖ CELLULOSA A.-B.
Sprängsviken, Sweden

Bleached Sulphite

KELLNER-PARTINGTON PAPER PULP CO., LTD.
Sarpsborg, Norway
Edsvalla, Sweden
Hallein & Villach, Austria

Unbleached Sulphite

AKTIESELSKABET GREAKER CELLULOSEFABRIK
Greaker, Norway
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
CELLULOSEFABRIKS A.-B.
Bruksfors, Cascho-Skandsel
SVANÖ AKTIEBOLAG
Svanö, Sweden

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY

CANTON, MASS.

Woolen manufacturers since 1856

Mundt

Perforated Screens For Pulp and Paper Mills

Steel, Copper, Brass
Bronze, Monel Metal
and Other Alloys
Punched for Centrifugal
and Rotary Screens,
Pulp Washers, Drainer
Bottoms, Filter Plates, etc.

Charles Mundt & Sons
67 Fairmount Ave. Jersey City, N. J.

ENGLISH ECCO CLAYS CLAYS

TRADE MARK

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

No. 4 White Linens	2.25	@	3.25
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	3.00
No. 4 White Cotton	1.90	@	2.20
Extra Light Prints	2.00	@	2.40
Ord. Light Prints	1.75	@	2.15
Med. Light Prints	1.55	@	1.95
Dutch Blue Cottons	2.25	@	2.50
French Blue Linens	3.00	@	—
Checks and Blues	2.00	@	—
Linsey Garments	1.90	@	2.00
Dark Cottons	1.50	@	1.60
Old Shopperies	1.30	@	1.45
New Shopperies	1.45	@	1.50
French Blues	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.40	@	2.50
Domestic	2.25	@	2.35
Wool Tares, light	1.80	@	1.90
Wool Tares, heavy	1.90	@	2.00
Bright Bagging	1.70	@	1.80
Manila Rope—			
Foreign	2.60	@	2.75
Domestic	2.50	@	2.75
Jute Threads	2.75	@	3.00
Sisal Strings	1.50	@	1.60
Mixed Strings	.60	@	.70

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.50	@	2.60
Ordinary Hard White No. 1	1.90	@	2.00
Soft White No. 1	1.75	@	1.80
Soft White Extra	2.25	@	2.40
Flat Stock—			
Stitchless	.80	@	.85
Overissue Mag	.70	@	.75
Solid Flat Book	.60	@	.65
Crumbled No. 1	.40	@	.45
Ledger Stock White	1.15	@	1.25
Ledger Stock Colored	.65	@	.70
New B. B. Chips	.15	@	.20
Manila—			
New Env. Cut	1.40	@	1.50
New Cuttings	1.25	@	1.35
Old Kraft Machine-Compressed bales	.65	@	.75
News—			
No. 1 White News	1.35	@	1.40
Strictly Overissue	.50	@	.55
Strictly Folded	.30	@	.35
No. 1 Mixed Paper	.15	@	.20

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.11	@	.13
White Hemp	.12	@	.14
Fine Polished—			
Fine India	.15	@	.17
Unpolished—			
Box	.08½	@	—
Paper Makers	.07½	@	.08½
Tube Rope	.09	@	.10
Wall Paper	.10	@	.11
Wrapping	.11	@	.13
Soft Fiber Rope	.09½	@	.11½
Cotton	.17	@	.22

(Hard Fiber)

Medium Java	.10	@	.16
Mex. Sisal	.09	@	.15
Manila	.18	@	.25

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.06	@	.06¼
New White, No. 2	.03½	@	.04
Light Silesias	.03½	@	.04
Silesias, No. 1	—	@	.04½
Black Silesias, soft	—	@	.03
New Unbleached	.05½	@	.06
Washable, No. 1	.01½	@	.01¾
Blue Overall	.04	@	.04½
Cottons—Acording to grades—			
Washable No. 2	.01	@	.01¼
New Blue	.01	@	.01¼
Fancy Percales	—	@	.02½
New Black Soft	.03	@	.03½
New Light Seconds	—	@	.04½
New Dark Seconds	.50	@	.75
Khaki Cuttings—			
No. 1 O. D.	.03	@	.03½
No. 2 Mixed	.02	@	.02½
Corduroy	—	@	.02
New Canvas	.05	@	.05½
New Black Mixed	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.25
Miscellaneous	2.50	@	2.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1	—	@	.95
Domestic No. 1	—	@	.95
Domestic No. 2	—	@	.85
Roofing Bagging	—	@	.60

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.75	@	2.00
Domestic	1.50	@	1.75
Manila Rope	2.75	@	3.00
Sisal Rope	1.50	@	1.75
Mixed Rope	.75	@	1.00
Scrap—			
No. 1	—	@	1.50
No. 2	1.00	@	1.25
Wool Tares, heavy	3.25	@	3.50
Mixed Strings	.75	@	1.00
No. 1 New Light Burlap	2.50	@	3.00
New Burlap Cuttings	1.75	@	2.00

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White	1.75	@	1.80
No. 2 Soft White	1.30	@	1.40
No. 1 Mixed	.65	@	.75
Solid Ledger Stock	1.45	@	1.50
Ledger Stock, white	1.15	@	1.20
Ledger Stock, colored	.75	@	.80
No. 1 Books, heavy	.60	@	.75
Manila Cuttings	1.45	@	1.50
Print Manila	.40	@	.45
Container Manila	.35	@	.40
Kraft Paper	.75	@	.80
No. 1 Mixed Paper	.20	@	.25
Straw Board Chip	.25	@	.30
Binders Board Chip	.25	@	.30
Corrugated Board	.50	@	.55
Overissue News	.40	@	.45
Old Newspapers	.35	@	.40

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White	1.85	@	2.15
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.30	@	—
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	.65	@	.75
No. 1 Books, light	.65	@	.75
Crumpled Stitchless Book Stock	.55	@	.65
Manila Env. Cuttings	1.85	@	2.00
Manila Envelope Cuttings, extra quality	2.00	@	2.10
No. 1 Old Manila	.80	@	.90
White Blank News	1.30	@	1.40
No. 1 Kraft	.90	@	—
Mixed Papers	.15	@	—
Print Manila	.45	@	.55
Container Manilas	.27½	@	—
Old Newspapers	.25	@	.32½
Paper Wool Strings	.65	@	.75
Overissue News	.45	@	.50
Box Board Chips	.20	@	.25
Kraft corrugated boxes	.70	@	—
Kraft corrugated boxes	.65	@	.70
Screening Wrappers	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.85	@	2.90
Domestic	2.65	@	2.75
Sisal Rope	1.65	@	1.85
Mixed Rope	.50	@	.75
Transmission Rope	1.90	@	2.00
Soft Jute Ropes	1.85	@	2.00
Jute Carpet Threads	.75	@	.90
Gunny Bagging—			
Foreign	2.00	@	—
Domestic	1.75	@	—
Bleachery Burlap	3.25	@	3.62½
Scrap Burlap—			
Foreign	1.60	@	—
Domestic	1.40	@	1.55
Scrap Sisal	1.25	@	1.50
Scrap Sisal for Shredding	1.75	@	1.90
Wool Tares, Heavy	1.65	@	—
New Burlap Cuttings	2.00	@	2.25
Aust. Wool Pouches	2.75	@	3.25
Heavy baling bagging	1.75	@	—
Paper Mill Bagging	1.00	@	1.15
No. 2 Bagging	.55	@	.75

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.03¼	@	.03½
New White No. 1	.06¾	@	.07
New Light Flannelettes	.04¼	@	.04¾
Silesias No. 1	.04¼	@	.04½
New Black Silesias	.03¾	@	.04
Silesias No. 1			
Soft Unbleached	6.50	@	7.00
Blue Cheviots	.05	@	.05¼
Fancy	.03	@	.03¼
Washable	.02¾	@	.03
Cottons—According to grades—			
Blue Overalls	.04¾	@	.05
New Black, soft	.03¾	@	.04
Khaki Cuttings	.03¼	@	.03½
O. D. Khaki	.04	@	.04½
Corduroy	.02¾	@	.03
New Canvas	.06¼	@	.07¼
B.V.D. Cuttings	—	@	.06½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.75	@	2.00
Old Blue Overalls	1.50	@	—
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	3.90	@	4.00
Roofing Stock—			
No. 1	1.00	@	1.10
No. 2	.75	@	.85
No. 3	.65	@	.70

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.05	@	1.15
Dutch Blues	2.65	@	2.75
New Checks and Blues	2.85	@	3.00
Old Fustians	2.25	@	2.50
Old Linsey Garments	2.20	@	2.25
New Silesias	4.75	@	—

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	1.80	@	1.90
No. 1 Hard White	1.70	@	1.80
No. 1 Soft White	1.50	@	—
Ledger & Writings	.75	@	.80
Solid Books	.45	@	.50
Blanks	.90	@	—
Krafts	.45	@	.50
New Kraft Cuts	1.10	@	—
Manila Env. Cuts	Nominal		
Ex. No. 1 Manila	Nominal		
Print Manila	Nominal		
Overissue News	.35	@	—
Old Newspapers—			
No. 1 Folded News	.25	@	.30
No. 1 Mixed Paper	.15	@	.30
Roofing Stocks—			
No. 1	1.00	@	1.05
No. 2	.85	@	—

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.36½	@	—
No. 1 Tints	.37½	@	—
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	15.50	@	16.50
No. 4 Tints	16.50	@	—
No. 5 Bond—White	11.25	@	—
No. 5 Bond—Tints	12.25	@	—
No. 5 Bond—Golden Rod	12.75	@	—
No. 5 Ledger—White	11.25	@	—
No. 5 Ledger—Tints	11.25	@	—
No. 6 Bond—White	10.15	@	—
No. 6 Bond—Tints	10.65	@	—
No. 6 Bond—Golden Rod	12.15	@	—
No. 7 Bond—White	8.50	@	—
No. 7 Bond—Tints	9.00	@	—
No. 7 Bond—Golden Rod	10.50	@	—
Book—			
No. 1 M. F.	7.35	@	—
No. 2 M. F.	6.85	@	—
No. 3 M. F.	5.60	@	—
No. 1 S. C.	7.60	@	—
No. 2 S. C.	7.10	@	—
No. 3 S. C.	6.10	@	6.35
No. 1 Coated Book and Litho	12.50	@	—
No. 2 Coated Book and Litho	11.00	@	—
No. 3 Coated Book and Litho	10.00	@	—
Coated tinted	13.50	@	—
Wrapping—delivered—			
Rag Brown	4.85	@	5.25
White Wrap	4.00	@	—
"B" Manila	4.90	@	6.15
No. 1 Manila	5.50	@	6.90
Fiber	5.50	@	6.90
Kraft No. 2	5.50	@	6.90

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)	46.00	@	—
Sheets	54.00	@	—

Pulp

Ground wood	29.00	@	—
Unbleached Sulphite	49.00	@	—
Kraft	50.00	@	—
Soda	54.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.25	@	—
Soft White	2.15	@	—
White Blk. News	1.25	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.80	@	—
Light and Crumpled Book Stock	.70	@	—
Ledgers and Writings	1.10	@	—
Manilas—			
New Manila Cut	1.35	@	—
Printed Manilas	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue	.50	@	—
Strictly Folded	.45	@	—
No. 1 Mixed Paper	.30	@	—

Domestic Rags

(Price to Mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06½	@	.06¾
Fancy Shirt Cuttings	.02¼	@	.02½